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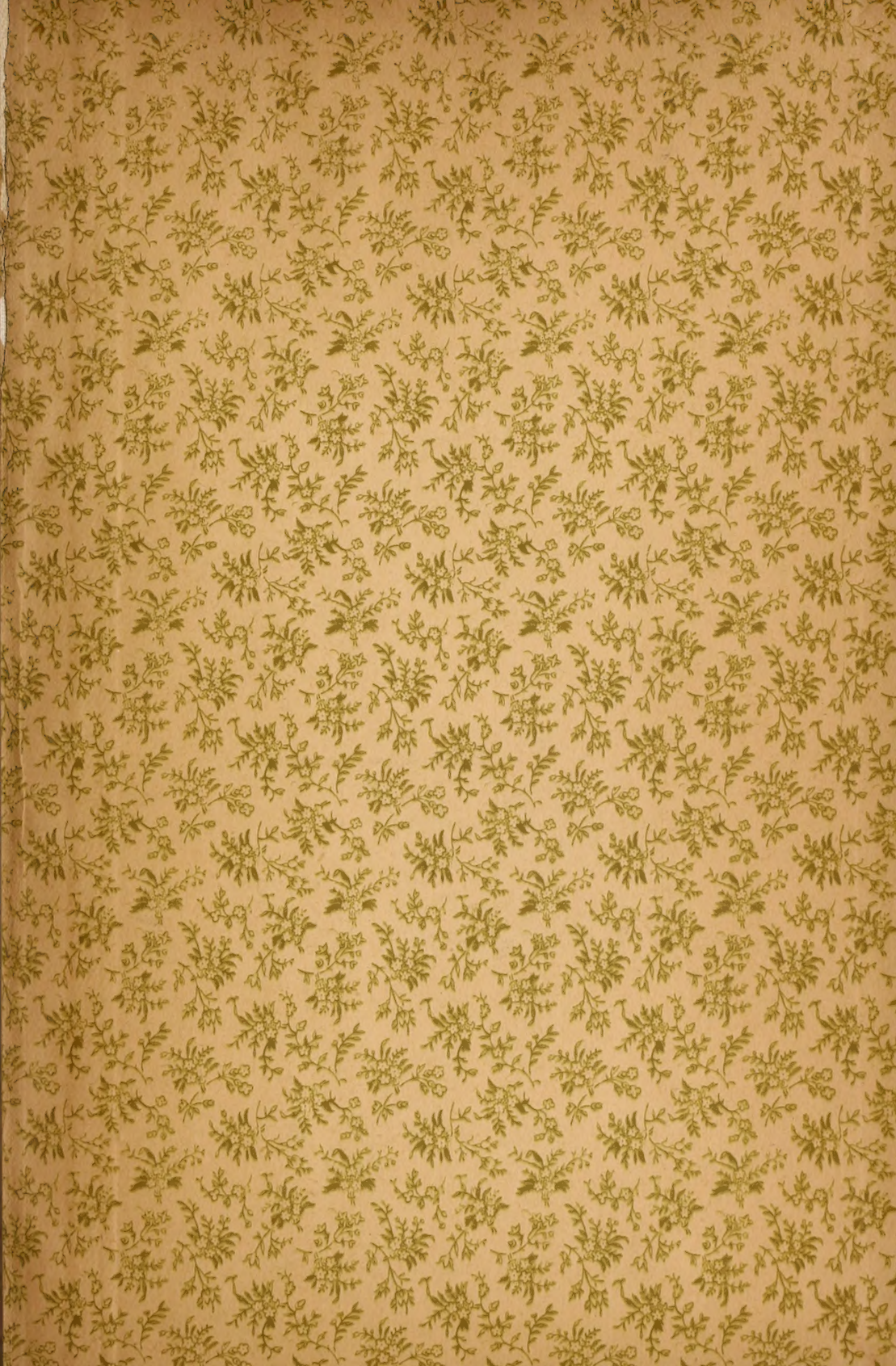


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THE

# Dental Summary

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COLUMBUS, OHIO

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# THE DENTAL SUMMARY

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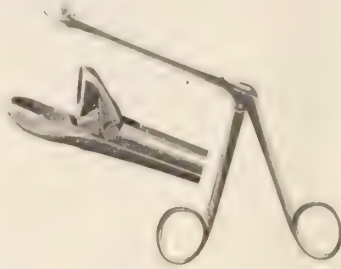
## A GUM GUILLOTINE

By W. H. Whitslar, M. D., D. D. S., Cleveland, Ohio

ONE of the most painful and difficult operations is to remove inflamed gum tissue overlapping the third molars. Various instruments have been devised for this operation and none will answer all purposes. For this reason it has been an annoyance to be defeated in procuring satisfactory results, inasmuch as the tissue in this neighborhood is often tough and slippery.

I have been constantly on the lookout for some instrument that would give more universal results, until last spring, in looking over a large stock of surgical instruments in one of our supply stores (Schueman-Jones Co.) I discovered what seems to fill the wants so long desired. The very day I purchased the instrument I had a case needing its use, and three more followed the same week. Since this time frequent use has proven the merit of the instrument and its value above any other that I know of for the purpose

of cutting the gums over third molars. But as I have said before, no instrument singly is applicable in all cases. There are places where it is necessary to slit the gums on buccal and lingual sides in order to let the instrument grasp the flap, then it will snip out the tissue clean and no tearing. The entire occlusal surface of the molar can be exposed in less time than it takes to write it.



The instrument is known as Gruenwald's Nasal Cutting Forceps, No. 3. It is an imported instrument which is used for cutting the bones of the nose. One jaw of the forcep is serrated, hence the name "alligator jaw" sometimes designates the style of the forcep. The other jaw I ground thinner so as to allow it to slip under the gum flaps easier.

My confreres who have used my forceps have bought for themselves, being pleased with the results.

The illustration here provided is clear and self explanatory.

## ALCOHOL AS A SUBSTITUTE FOR COCAIN IN ANESTHETIZING THE PULP\*

By E. Ballard Lodge, Cleveland, Ohio

THE observation that alcohol would anesthetize the pulp of a tooth was made on Sept. 30, 1911, when after two complete failures to desensitize the pulp with cocain introduced by means of a pressure instrument, and these at two separate sittings, I then resorted to alcohol 95% sol. (less by a small per cent of water which alcohol derives from the atmosphere, making, as some say, about 88%). I used a very few drops, perhaps three or four, and made a test with a smooth Donaldson's broach, and greatly to my delight I found that the pulp was completely devoid of sensation.

It was of great concern to the patient that this pulp be removed, as it had been responsible for an unusual amount of suffering for the previous two weeks. This was as a specially marked neuralgia in the right temple, accompanied with vague pains in the right lower jaw. The pulp in question proved to be that of the right lower second bicuspid. The pulp was removed in the usual way and without the least pain. There were no unfavorable after-results of any kind whatsoever.

\*Report of Clinic given at Ohio State Dental Society.



Since that time the writer and others have been using alcohol for anesthetizing pulps with very gratifying success. A pressure instrument is always used, and if an exposure already exists I believe it should be temporarily closed and a pit made in some accessible part the same as if there were no exposure.

If sensitive dentin is encountered a slight pit should at first be made and the high pressure instrument applied after which, if contact has been good, it will be found that the pit can be made deeper and the pulp nearly reached, when a little more alcohol may be introduced. If the pressure be increased too rapidly pain will be produced by the pressure, but by using care the pulp can be thoroughly anesthetized, greatly to the satisfaction of all concerned. I have recently found that a 25% solution of alcohol in distilled water will produce equally good results either for pulp removal or for sensitive dentin. I should recommend, however, that we use discretion in employing alcohol in pulps we do not want to endanger, as there may be a subsequent death of the organ. I believe, however, that it is something worth investigating and am free to say that I am using it in some well selected cases for sensitive dentin. The more sensitive the better the case, and there have been no bad after-effects thus far that I am able to report upon and I have seen most of my cases since with a view of testing the condition of the pulps. Nevertheless, I know it is possible to destroy the pulp in the employment of high pressure anesthesia no matter what drug is used, and would therefore warn against the careless use of this means of treating pulps. In pulps requiring removal it is a splendid substitute for cocain and what is more, it will work where cocain refuses at times to have any perceptible anesthetic value. It is well known that in cases of pulp degeneration that such is sometimes the case. In addition to these things, alcohol in the minute quantities necessary is non-toxic and it is antiseptic. One manufacturer of high-pressure instruments tells me that this discovery, that alcohol will do what we know it will do in supplanting cocain, will double the sale of his instrument.

Dentists are glad to get away from cocain because of its poisonous effects, and an efficient non-toxic substitute is welcome. Even this must be used with care, as undoubtedly an amount could be forced into the tissues beyond the tooth operated upon, to do damage, but these things can be avoided by care.

Only a smile! Yet it cast a spell  
Over the sky which had been so gray;  
The rain made music wherever it fell;  
The wind sang the song of the marriage-bell;  
And the heart was light and gay.

## ROENTGEN DIAGNOSIS IN DENTISTRY.\*

By George C. Chene, M. D., Detroit, Mich.

Roentgenologist, Hotel Dieu and Providence Hospitals; Assistant Roentgenologist St. Mary's Hospital; Member of the American Roentgen Ray Society, etc.

**T**HE HISTORY of dental radiography dates from the first exhibition of skiagraphs of the teeth by Prof. Koenig, to the Society of Physics of Frankfort-on-the-Main, in February, 1896.

The following fifteen years have seen such vast improvement in the technique of Roentgenology that today there is scarcely a case in dentistry that the Roentgen rays may not valuably elucidate.

Surely those of us who have had occasion to observe a considerable amount of dental Radiography cannot be but impressed with the frequency of incomplete canal fillings with their attendant evils. It has been suggested to ray all canals with a fine probe temporarily in situ, to ascertain the thoroughness of one's work before a permanent filling be introduced. To thus make an X-ray examination in every case would be ideal in the minds of some, and to others would be thought equally absurd. However, in those obscure, difficult or chronic cases, surely neither the patient nor the dentist himself should be deprived of this more exact method of diagnosis.

The purpose of a Roentgen examination is not to make a picture, but to assist in arriving at an accurate diagnosis; hence in order to secure results which will be worth while to the patient and the dentist, this work should not be entrusted to photographers or electricians, but to those who are acquainted with the normal and pathological anatomy of the region examined. In many cases it is necessary to make several exposures at different angles to eliminate superimposition of various parts and thus render more clear and exact the origin and extent of the pathological process.

One not conversant with the pathological possibilities of the case might be satisfied with a single exposure, and thus not locate the trouble (e. g.), perforations.

Assuming that a radiograph rich in detail is secured, then comes the more difficult procedure, that of its interpretation.

It must be borne in mind that the Rays are projected in straight lines and record on the film or plate the density of the tissues traversed. Obeying absolutely these physical laws, they cannot deceive us. Failures in radiography are due to faulty technique or erroneous interpretation, and not to the rays themselves.

The interpreter must know which pathological conditions increase density and which lessen density of the tissues, and also know their characteristic appearance when projected on the film or plate. He should also know the relative positions of the tube, the film and the part examined, in order to make allowance for distortion, if such exist.

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\*Read before the Michigan First District Dental Society, 1911.





Fig. 1.—Unerupted tooth with regulating device attached. Tooth lies at right angles to normal plane showing impossibility of attempted regulation.

Fig. 2.—Broken pin of Richmond crown.

Fig. 3.—Abscesses involving upper centrals. Probes in situ.

Fig. 4.—Broken broach.

Fig. 5.—Absorption too extensive to suggest further effort to save tooth.

Fig. 6.—Impacted molar.

Fig. 7.—Bridge over unknown unerupted tooth.

Fig. 8.—Incomplete canal filling with abscess.

Fig. 9.—Perforating canal filling.

Fig. 10.—Embryonic tooth in large dentigerous cyst. X Ray finding eliminates malignant neoplasm.

Fig. 11.—Unsuspected retained root with abscess.

Fig. 12.—Apical abscess.

Fig. 13.—Antrum twice unsuccessfully drained before radiograph showed this retained root.

Fig. 14.—Demonstrating unerupted tooth suggests proper regulation.

More information will be gained from examination of the original film or plate, as considerable detail is lost in reproduction. A white or North light is essential for interpretation, as the value of a good radiograph may be under-estimated if examined in a poor light.

Among the dental lesions peculiarly adapted for Radiographic examination may be mentioned the following:

In abscesses the Rays will show whether the root or the alveolar process is involved, and thus suggest whether the treatment be drainage through the canal, curettage of the alveolus, or excision of the root.

Information regarding the direction of the root canal in some cases is essential, and easily demonstrated by this method.



A pericementitis appears as a fine light line between the root and alveolus.

Radiographic knowledge of the presence or extent of abscess formation is especially valuable before crown or bridge-work is fitted, and equally valuable before removing such work from healthy teeth.

If bismuth paste is used, the extent and direction of sinuses may be ascertained; also the thoroughness of the injection.



Broken instruments, perforating fillings and buried roots with their attendant complications are readily diagnosed. Impacted teeth, pulpstones, exostoses, and the differentiation of malignant neoplasms from odontoma or dentigerous cysts are clearly shown.

Pus in the antrum may be demonstrated to be of dental origin.

In intra-alveolar fracture of roots and fractures of the maxillae, the Rays afford valuable aid.

The X-Rays are especially valuable to the orthodontists. "These gentlemen agree that the deciduous teeth are often sacrificed too early, leading to under-development, and later deformities of the jaw. On the other hand, a deciduous tooth often interferes with the eruption of the permanent teeth. What other accurate guide have we in the control and observation of the erupting teeth? Sometimes two teeth present where normally there should be but one. The Roentgen rays will show which is the better shaped tooth, hence which to extract to insure the better regulation and result."

That these rambling remarks prove the X-Rays to be a valuable addition to the dentist's armamentarium cannot be disputed. The only possible objections to their use are, first, that of the patient's fear of being burned, and second, the fee. Regarding the former, the heavier improved apparatus requiring but a few seconds' exposure, is absolutely without danger. Regarding the fee, I personally feel that the Roentgenologist is not making pictures at so much a dozen, but endeavoring to throw some light on the diagnosis, and that all patients should be accorded the best methods at our disposal; the poor can pay little or nothing and the wealthy more.

In conclusion, I believe the Roentgen rays should be more generally used in dentistry, as it is without danger in the hands of an expert, and is a harmless, clean and exact diagnostic aid.

#### DISCUSSION.

DR. DON M. GRAHAM, Detroit: There is very little that can be discussed profitably in regard to the paper or slides further than what has been said by the essayist.

The slides that he showed speak for themselves, but I want to add that they don't speak as eloquently as do the films. The film is always more faithful than the slide. You can see the little details and finer lines so much better with the original film than you can from even the photograph, and especially much better than you can from the lantern slide.

The essayist has well said that Roentgenology consists of two things—proper technique and proper interpretation. The technique, of course, comes only from experience, and we must watch very carefully the angles at which we radiograph our teeth. More than once we have opened into the wrong tooth even after we have had a radiograph, and after the demonstration that was given by the first slide, which shows the way the rays of light come from the anode, I think it is very plain to us why such might happen. For instance, if you have an abscessed buccal region, you can radiograph that in such a way that your cuspid is superimposed above that cavity. It will then appear as if the cavity or liquefaction is over your cuspid. We must be very careful of our positions, and it is for that reason that more than one exposure is necessary.

With our radiograph, however, we should never forget our old means of diagnosis—percussion, thermal and electric stimulation, etc., because, after all, the radiograph is supplemental and confirmatory, in a very great many cases. In antral cases it has been said that it is absolutely of no use. So far as we dentists are concerned, it is of a very great service because it will show, in nearly every case, whether that antral empyema is of dental origin, and that is all that concerns us. If that empyema be not of dental origin, its treatment does not concern us, except that we should intelligently refer our patient for proper treatment. He showed one slide which beautifully illustrates this point. Another slide which he showed was somewhat dense, but very beautifully showed how nearly the roots approach the antrum, and how very easily we may get antral infection of dental origin. There are, however, some limitations to radiography. For instance, if you perforate a root and the perforation be in the antero-posterior position it is almost impossible to discover that by your X-ray. If, however, the perforation be mesially or distally it can be shown in the vast majority of cases. So that it is not safe for us to conclude, because the skiagraph does not show the perforation that it was not perforated. So again I say that the use of the skiagraph should be confirmatory and not absolute. We should never lose sight of our old means and methods of diagnosis. The same thing applies in medicine. While we have our Widal and tuberculin tests, the careful physician does not make a diagnosis by these alone.

There is just one thing that I would like further to state, and that is that you will find in your radiographs that some of your teeth will look like hopeless wrecks, they appear to be hopeless wrecks. They are not as hopeless as they appear, because the soft tissues are not shown on your film, and if you do not find the proper angle your tooth may look very short, and the osseous attachment will seem almost nil. That tooth, while it may appear a hopeless wreck from your radiograph, may still give good service for a great many years.

The radiograph is of great service, often, where we have crowned or bridged teeth, and where the upper third, fourth or fifth of the root is unfilled or unclaimed, eroded or corroded, and where simple amputation or curettage would place them in splendid condition. In these cases the removal either of the crown or bridge is hazardous in the extreme, as you are liable to split or perforate your root and spoil the whole work. If you had a good skiagraph you could ascertain the length of the unclaimed root, the position of your root canal filling, when amputation or curettage might place the whole structure in good condition.

There is no field in the healing art that offers such splendid opportunities for radiography as the dental apparatus, for the simple reason that radiography is a record of density rather than a photograph. In the dental apparatus we have structures of different densities. We have the soft tissues consisting of the gum tissues, pericementum and the pulpal tissues. We have the bony tissues, made up of alveolus, the teeth proper. We have, besides that, our crowns, our dowels, our fillings and our root canal treatments. The X-ray will show these to be a measure of different densities. They will all be shown up, and there is nothing that will show so beautifully as gutta percha. Medicated powders will not show, but while these powders will not show, you will nearly always find, to designate its presence, an incipient abscess or necrosis at the end of that root. If radiography has done nothing else than show us the folly of slip-shod root canal treatments and the unscientific use of medicated cottons and powders, our efforts in this direction have been well repaid. It has proven, beyond a doubt, that there is nothing superior, if equal to gutta-percha as a root canal filling.

DR. GIRARDOT, Detroit: I feel that I cannot, too strongly, emphasize the fact that we should use the X-ray more than we do, not only for our patients' good, but also for our own peace of mind. Having once become acquainted with its great possibilities in dentistry you will wish to use it more every day. In fact, I think the



day is fast approaching when every up-to-date dentist will have at least a small X-ray equipment for his light work.

There is one thing I would like to ask Dr. Chene—he touched on it only slightly—that is, about the use of bismuth-subnitrate paste. Its healing properties were first discovered, I believe, in X-ray work in the softer tissues of the body. I would like to ask if he has ever used it in connection with dental skiagraphs. The other day I thought that I would try it, but after so doing, did not get the expected results. As it was, this happened to be a case of a right upper second molar of a rather abnormal shape in which I had succeeded in locating only two root canals. Between the first and second molar teeth existed a fistulous opening, and I suspected that perhaps the missing root-canal was the cause of this abscess. The X-ray showed me that this was not the case, but that the first molar, presumably affected with pyorrhea, gloried in a pericemental abscess involving both bicuspsids to a slight extent. Taking two pictures, one with paste and one without, showed but very little difference between the two. Whether it was because the paste was not strong enough I do not know.

Dr. Graham spoke of showing up our dowels and root-canal fillings. He did not mention our broken broaches; I presume he occasionally breaks broaches as we other poor mortals do. I break them and frequently cannot get them out, especially a Kerr broach; which generally disturbs my peace of mind for a few days unless I take an X-ray picture. This brings to my mind a certain case that forcibly demonstrates how the X-ray will show up unknown and unexpected conditions.

I had broken a broach in the lingual root-canal of a first bicuspid that I intended to crown. The X-ray picture showed that by filling the buccal canal the end of the lingual would be sealed and the broach cause no trouble. To my surprise I found the root of the cuspid half filled and a very large abscess on the end of it. The pus seemed to escape along the side of the first and second bicuspsids, which I had thought were slightly affected with pyorrhea. This cuspid tooth had given no indication whatever of the trouble that existed.

I would also like to ask Dr. Chene if he has ever used, or known to be used, the stereoscope. I believe it has been evolved that by taking X-ray pictures at different angles and placing them in front of the stereoscope, the depth of the bone or tooth can be seen in the surrounding tissues. I do not know if this has been done with dental skiagraphs or not, perhaps Dr. Chene could tell us something about it.

DR. ALVORD: I would like to ask about the relative density of necrosed bone and healthy bone tissue. I would also like to say that I regard almost entirely the value of an X-ray in the light of a protection. Of course, it is up to the operator and the dentist as to whether the exposures are satisfactory or not, but I don't think that any man, short of considerable experience in varied readings, has a right to express an opinion on a skiagraph, and for that reason I should rather regret the general adoption of small equipment in the office. I do, however, very thoroughly endorse this idea of the properly equipped radiographer in diagnosis, and I will say that I have had some very great help from that line of work.

DR. G. C. CHENE (closing discussion): I am glad the gentlemen have discussed this paper so leniently and pleasantly; if I did omit some things, evidently they have now been covered.

Dr. Graham mentioned, as I said in the paper, that some of these projections on the screen by no means give one an idea of the detail that is in the original film or plate. It is practically impossible to get that fine detail thrown upon the screen, and some of these films would be very much more pleasing to the eye if looked upon than as we saw them on the screen tonight.

Dr. Graham also mentioned about perforations being at certain angles and being very difficult to show, which is true, and incidentally answering Dr. Girardot's question, stereoscopic radiography of the teeth is coming in vogue now, and in that way we get

that third dimension. Stereoscopic radiography is nothing new, as Dr. Girardot may have given you the impression. We have been doing stereoscopic work ever since the science became known. However, it is a little difficult to arrange the apparatus, to change the films in the mouth. Stereoscopic radiography depends upon taking two radiographs. The relation of the films and teeth are the same in both exposures; however, the tube is shifted about  $2\frac{1}{2}$  inches, the distance between the pupils of the eyes, so that we get one picture taken looking from one eye, and the other looking from the other eye. Then by viewing these two plates in the proper apparatus, the stereoscope, we get the third dimension, such as we have all seen in stereoscopic views—those little views that some of us have in our office or home. In that way we get the third dimension; we not only get the height and width but the depth, and we are “able to look around the corners,” as it were. These cases of perforations at difficult angles should be taken in that way, when we are unable to demonstrate them otherwise.

We have the various kinds of stereoscopic apparatus in our office, and have had for some time.

Dr. Graham mentioned that some of our teeth look like hopeless wrecks, when we look at the skiagraph, and that is so; but we must bear in mind that we may deceive ourselves in interpreting the skiagraph. Things may look worse than what they are, but the skiagraph itself is not to blame. If there is an error in interpreting the plate, it may look worse, and that is why we should acquaint ourselves with a large number of cases, and the interpretations should be made by those with considerable experience, otherwise we are apt to get into some error.

Regarding bismuth paste, spoken of by Dr. Girardot, evidently his reason for not seeing any paste was due to one of two things, I think—either that the paste was not injected where he thought it was—it leaked out upon the gum or remained in the syringe, or did some such thing—or there was not enough bismuth mixed up in the paste, because bismuth is quite opaque to the rays, and if it is there it will show. I have had some cases where the dentist used an old metal syringe and was unable to estimate just how much bismuth was injected into the gum. In that way one cannot tell just how much is injected. Some think it is going in, but it may be leaking out around but not in the tissues. I would suggest that glass syringes be used in injecting sinuses with bismuth, and in that way we are better able to tell where our bismuth is going.

Dr. Girardot said Dr. Graham did not mention anything about broaches being left in. However, I showed a slide showing a broken broach within the tooth.

Regarding Dr. Alvord's question, about the appearance of normal and necrosed bone. In necrosis we have absorption of the lime salts, and later the connective tissue of the bone, and in that way necrosed bone always appears lighter, or casts less shadow density than the normal bone.

I think Dr. Alvord has also taken up that point of interpretation very well. It is about fifteen years since Roentgen gave the world this discovery, and it was hailed as a great panacea, like radium and various other things. However, it came into disrepute, for the reason that every quack bought an X-ray apparatus and began to “take pictures,” knowing nothing of the technic of same. Ofttimes the conditions shown by such radiographs were much distorted and the surgeon, endeavoring to correct such exaggerations, would get bad results and would say, “Your X-ray is no good.” Therefore, the technic must be exact.

Possibly there is one thing that has not been discussed enough, or emphatically enough, that is the fee. As I mentioned in my paper, I would like to call attention to that. About a year or more ago I tendered my services to this society, which were accepted, to do any dental radiography gratis that might come up at the Grace Hospital Clinic, as I am very much interested and can oftentimes learn something from the case. In general, those who can well afford we will make settle for those who cannot. And I trust no patient will be deprived of radiography on account of the fee.

**CROWN AND BRIDGE WORK.\***

By E. L. Kanaga, D. D. S., Philadelphia, Pa.

THE METHOD of restoring and replacing lost teeth by crowns and bridges is a blessing to humanity when wisely and skillfully used, but a curse when delivered from the hands of an operator who is careless in his work, one who uses it unwisely or for the sole reason that it brings a greater fee than would be realized from a partial denture in the same case.

Many bridges are made entirely in the general laboratory, even the fitting of the bands and the inserting of the pins, on a plaster cast. Such practice is surely to be condemned. However, I do not wish to criticise the man who turns the assembling of bridges over to a laboratory assistant or employs the services of a general laboratory man. This arrangement in the majority of cases is probably best. The general practitioner who is constantly busy at the chair hasn't time to devote to laboratory work, and consequently gets out of practice in using the blow-pipe and other apparatus necessary for this work. In such a case it is wiser to give way to the laboratory man who is practiced in that branch. If the preparatory work in the mouth is properly done, such as the shaping of the roots and the adaptation of the bands, the bridge will be passable at least, no matter how poorly assembled the piece might be. But if the roots are not properly prepared and the bands are poorly fitted the bridge cannot be made a success even by the most skillful manipulation in the laboratory.

The first consideration in making a crown or a bridge should be to preserve the roots utilized, as well as the adjoining teeth. In porcelain inlay work the matching of shades is secondary to perfection in fit. In all our filling operations we strive to prevent a recurrence of caries. That is to say, we endeavor to preserve. But in crown-work and bridge-work the popular idea seems to be to restore the function of mastication only, paying too little attention to the future welfare of foundations.

In viewing each piece of bridge-work which comes under my observation, my criticism is not primarily upon the bridge itself, as to whether the joints are lapped or butted, soldered or sweated, as to whether the backings extend between the facings and cusps, or whether the bridge is a finished piece of workmanship, but as to its cleanliness and the effect it is having upon the surrounding area. If the gum tissue is of an unhealthy appearance, swollen and inflamed areas about the abutment roots, and food debris lodged about the dummy teeth, the bridge is ugly to look upon although it may have been apparently beautiful upon the plaster cast. The responsibility for such conditions can in no way be shifted to the laboratory man, nor even to the general laboratory, but must come back to the original operator.

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\*Read before the Lake Erie Dental Society, 1911.



To avoid these conditions what precautions are necessary? First let us consider the abutment roots. The canals of these teeth should be filled even into the apical foramen, and to accomplish this certain popular instruments should not be depended upon. In my opinion, barbed broaches give very poor satisfaction when dealing with the apical region of root canals. Possibly they do their work well in such canals as will receive them, or in uncertain portions of most canals to which they are peacefully admitted, but I desire to dictate to the tooth and not subside to the limitations placed upon one particular instrument by the root canal. The diameter of the smallest barbed broach is considerably greater than the breadth of any root canal in the apical portion except in very rare instances. How, then, is it possible to thoroughly cleanse this all-important area, or to be reasonably sure that the nerve has been entirely removed? Twist hand drills, according to my idea, are the proper instruments with which to delve into the extreme depth of root canals. Either the Kerr or Downey broaches may be used, but it is a great mistake to have them too small. Only two sizes, coarse and extra coarse, should be employed. The smaller instruments are too frail to be serviceable and the large ones can be forced into any straight canal. The greatest advantage of these broaches is, that the operator can with a great degree of accuracy, be quite certain as to when he has reached the end of the root. The apical foramen is located in a structure, the pericementum, which is much harder than dentin. These two substances cut so differently with twist drills that it is quite easy to perceive when you have passed from one into the other. I believe that more fine broaches are broken by twisting them into the hard pericementum of the apex than in the dentinal portion of the tooth. By reaming canals with the instruments mentioned they will admit gutta-percha points of such proportions as to be strong enough to resist buckling. Crooked canals are best treated with smooth broaches and sulphuric acid or sodium and potassium.

After thoroughly caring for the canals of all teeth to be used, our attention is then directed to the outer portion of the roots. To place bands upon roots for Richmond, porcelain, or shell crowns, without causing after irritation to the surrounding tissues, is an operation which requires skillful manipulation and a working knowledge of certain causes and effects. This in fact is the foundation of success in bridge-work. If all the enamel has been taken from a tooth and it is replaced by a band of gold or platinum which firmly hugs the root at all points, and if the band is free from all roughness and jagged edges, the surrounding area will remain in perfect health. A portion of a band standing out from the root, even though it be but a trifle, will cause great irritation and is just as objectionable as one which goes deep into the tissues. Teeth and roots should be so prepared that when a band is in position that portion of it which is highest under the gum will be in contact with the greatest diameter of the root. In other

words, the abutment tooth is slightly conical so that the higher a band is forced, to a certain limit, the tighter it will hug the root.

The greatest diameter of the dentin of a tooth is at a position slightly under the gum. From this point to the incisal or occlusal surface the diameter of the dentin diminishes and the enamel increases in thickness, forming the contour and general outline of the tooth.

To properly prepare roots for crowning, all enamel should be removed, not that it in itself is detrimental, but the root minus the enamel is of the correct shape to receive the band. It is needless to say that the devitalization of nerves is absolutely essential to this style of preparation. It is quite true that pulps will remain alive and healthy under crowns, but necessarily such teeth have not been properly trimmed. In such a case the band cannot be correctly adjusted to the root and therefore the nerve is kept alive at the expense of the pericemental membrane and the adjacent tissues.

In preparing the anterior teeth, they should first be ground down to within one-sixteenth of an inch of the gingival line, but not further until after the band has been fitted. If more than a sixteenth of an inch of the root is left standing, the operation is needlessly more difficult. If the root has been cut beneath the gingiva at the beginning of the work not only is the trimming much harder but the fitting of the band as well.

The number 3 crown-and-bridge scaler is used almost exclusively to remove the enamel of the anterior teeth. This instrument is double-sided and rather hook-shaped, resembling the prophylaxis instrument of the same number, though much heavier. The extreme point is the effective portion and is best used with a rocking motion. That is, after the fashion of a claw hammer.

The number 7 scaler, which is shaped like the number 3 except that it is thinner, is used between the teeth where the space is not large enough to admit the latter.

In preparing the posterior teeth for shell crowns, the work is done almost entirely with stones on the engine. The work is greatly facilitated if the mesial and distal sides are sliced off with thin stones rather than grinding them down gradually. The mesial cut can be made usually with flat stones, but the enamel of the distal side must be removed with one that is cup-shaped. The smaller cup-shapes are used on the lingual and buccal sides. The explorer should be frequently used and the grinding kept up until all undercuts have been eliminated.

The next consideration of our proposition to crown teeth without causing after-irritation in the surrounding area is the fitting of the band. If the roots have been properly trimmed of all enamel this is comparatively easy. If the roots have not been properly prepared it is absolutely impossible. An accurate measurement should be taken and the piece of metal to be used should be cut to the exact measurement with the two ends parallel to each other. The idea in having these ends parallel is to make the

circumference of the band the same at both ends, so that, in festooning, the measurement remains constant. Many prefer to procure the contour for the crown by flaring the ends, making the band in the form of an inverted cone. This procedure is entirely wrong, for the more such a band is cut out in festooning the greater the circumference becomes, the original measurement is lost, and the band cannot hug the root.

After soldering or sweating the band it should be shaped approximately to the root with the collar pliers, then pressed gently into position. No great force should be used with the first trial. Now the gum-line should be marked around the entire band with a heavy sharp-pointed instrument such as the number 3 scaler. This is very important, for after removing the band it permits us to see just where the metal passes too far beneath the gum-line and where not far enough. The band should be festooned according to this line and returned to position for a second marking. This should be repeated as often as is necessary to obtain the desired result, which is, to have the metal pass beneath the gingiva an equal distance at all points. Too little attention is paid to the festooning of collar crowns. A very great majority of shell crowns seen in the mouth extend too deep into the tissue in the interproximal space, and not far enough on the labial and lingual sides. It is not necessary to elaborate upon the importance of healthy spaces between the teeth, but this fact must not be overlooked, that it is absolutely essential to cut the bands well out at such places in order to keep those spaces in healthy condition.

A band may be tight on a root and yet not fit that root accurately, somewhat after the fashion of a hat that rests on the forehead and back of the head but does not touch the sides. By cutting the metal to the exact measurement and lapping the joint, we have a band that is just a trifle small. Driving such a band firmly into position, after it has been properly festooned, compels it to take the correct conformation. The metal will also stretch sufficiently to compensate for the lapped joint.

The next step in the Richmond crown is to add the floor. I believe that it is a great mistake to grind the band and root down together with a stone, or even to use a stone for this purpose. If the root is cut to any extent in this way, necessarily the gum is more or less mutilated, thereby depriving us of our guide, and we are unable to tell to just what extent we have ground the root in relation to the gingival line until after the crown is placed and the tissues healed. The correct and more humane method is to use the Ottolengui root facers. These instruments cut only on the end and, if the proper size is selected, will barely touch the gum tissue.

After having faced the root the band is placed in position and marked on the inside. It is then removed, cut down to this mark and the floor soldered or sweated.

With the Richmond crown the floor should be flat. It should extend well under the gingivae on the labial side but should be left high on the lingual. With the porcelain crown the lingual side, as well as the labial,



should be cut low. This is to give a greater bulk of porcelain, and it is the bulk of porcelain upon which we depend for strength in these crowns.

In the six anterior teeth the pins for the Richmond crowns should be placed lingually so that they will not interfere with the adjustment of the facings. With the porcelain crowns the post should be placed exactly in the middle of the floor so that it comes in the center of the entire bulk of the porcelain when the crown is finished. Round wire should be used for posts for the reason that a larger gauge round pin can be inserted in a canal of a given diameter than one of the square variety. That is to say, a fourteen-gauge round pin will go into a square hole of the same gauge, but a fourteen-gauge square pin will not go into a fourteen-gauge round hole.

The ordinary porcelain crowns may be used on any of the ten anterior teeth where the bite is sufficiently long to give a generous bulk of porcelain. Where the bite is short the Richmond crown is best for the six anterior teeth and the porcelain cup crown for the bicuspid. The latter differs from the ordinary porcelain crown only in the band, which is allowed to extend almost to the occlusal surface on the lingual two-thirds, the floor being sunken to a level with the gum line. A very good porcelain crown for bicuspid and molars is made by preparing a platinum cap in the ordinary way, grinding a Davis crown to it and casting a connection between the two.

#### SOLDERING AND SWEATING

Soldering is a process of uniting two metals by fusing into them another metal having a lower melting point than either of the two to be joined. The strength of a soldered joint depends upon the contact, the amount of solder used, and the degree to which it is fused into the other metals. If two metals are in perfect contact and the minimum amount of solder burned into the joint the highest efficiency is obtained. In such a case no free solder exists. That is to say, the fusing point of the solder that was, has been raised. Because, burning the solder into the gold has alloyed the two together in that area, raising the fusing point of the one and slightly lowering that of the other. If two metals to be soldered together are not in good contact, necessarily more solder must be used to fill the space, and this cannot be burned in to such an extent. In this case we are dependent upon a small quantity of a very weak and brittle metal for the strength of the entire piece. However, the physical weakness of a band made after this fashion of soldering is not its greatest objection. These joints are quite liable to open up at a subsequent soldering for this reason. Free solder existing, the fusing point of this joint area is the same as that of the new solder to be used, so that in carrying the piece up to the melting point of the new solder, that in the joint is being burned into the gold, and there being an excess the fusing point of that area is so much lowered that it is quite easily burned out. Ideal soldering is just a step lower than sweating, the actual melting of the two ends together. It is very good

practice to use less and less solder until joints can be made without it. The advantages of the sweated joint are threefold: it does not show, it is much stronger, and it does not open up at a subsequent soldering. In soldering platinum with pure gold the burning-in process is particularly necessary. The piece should be heated to absolute white heat and held there for half a minute, after which time the gold will have entirely disappeared. No free gold should be present where porcelain is to be baked for reasons well known. Not only will the gold endanger the qualities of the porcelain, but the joints will very probably open up in the baking, particularly if the contact is bad. If the gold is well burned into the platinum it alloys with it, making a platinum-gold alloy, which result is practically the same as using a platinum solder. Such a joint will not open up when the piece is baked, it cannot be unsoldered, and in fact is just as strong as one made with platinum solder using the oxy-hydrogen blow-pipe.

Soldering or sweating bands should be done with the blow-pipe. The melotte is probably best for this purpose. The flames should be about an inch long, using just enough air to keep it blue. It is desired to concentrate the heat at one point and yet let enough escape to heat up the sides of the band. As the temperature rises the gold will melt where the heat is concentrated. As the surface of the gold begins to soften and flow the point of the flame should be moved along the joint and in contact with it. If a dull-pointed flame is used the temperature of the metal rises gradually to the fusing point and sufficient time is allowed to move the heat along when the surface of the gold begins to fuse. If too hot a flame is used the melting point is so quickly overrun that it is impossible to move the heat away between the time when the surface begins to fuse and the piece is burned through. An excess of air makes the short blue flame sharp-pointed, concentrating the heat too much.

Stronger joints are made by lapping, for two reasons. The surface of contact is greater and the breaking stress is indirect. With the butted joint the surface of contact is equal only to the thickness of the metal. With the lapped joint the surface of contact may be made as great as desired, about twice the thickness of the metal used is preferable. The outside of the inner end should be filed to a thin knife-edge so that the inside of the band will be left smooth. The outer portion of the joint can best be evened up after the crown has been finished.

In soldering or sweating floors and cusps to bands the Bunsen burner should be used, holding the piece high in the flame till it is about ready to fuse, then lowering it to the inner point, allowing the flame to come up around the band. Floors can easily be managed by holding them with a small pair of tweezers, but cusps should always be wired to the bands.

#### INVESTING AND SOLDERING BRIDGES

There are many materials used in combination with plaster for investments, such as powdered asbestos, asbestos fibre, marble dust, pumice, white sand and red bird-sand. The latter is very fine and contains a good deal

of clay. I know of no better investment than is made from two parts of plaster and one part of this bird gravel. If such an investment is allowed to dry over night, just as the brick and tile makers thoroughly air-dry their materials before firing, it will get very hard, no wiring will be necessary and there will be no danger of fracture during soldering.

Bridges should be invested so that the facings lie in a horizontal position. The piece should have sufficient thickness up and down to give the necessary strength, and should be trimmed fairly close on the sides and ends. About half of each lingual cusp should be left free in open space. They need no protection from the sand and plaster, and in fact, being the greatest bulk of metal, require this exposure so that they may be easily heated. The cusps of shell crowns particularly should be slightly uncovered, for they must attain a certain temperature before the solder will readily attach to the band. If these cusps are covered and the flame directed upon the band for soldering, their greater bulk conducts the heat away almost as fast as it is applied, whereas, if the cusps are first heated they will aid in keeping the bands up to temperature to receive the solder. To repeat: covering the entire cusps with investment is no protection to them, but rather endangers the chances of success. The idea of the investment should not be to protect the piece from burning, but merely as a means to hold the various units together while soldering. The only protection the sand and plaster affords is to keep borax away from the facings. Of course, if there are any air-bubbles within a band, the heat is not conducted away as rapidly at that point and it is liable to burn.

Investments should preferably dry for several hours to obtain the greatest strength from the composition, but if time is limited the heating up may begin as soon as the investment is hard enough to handle. A low flame should be first applied, until the piece is thoroughly dry. This is merely to obviate the danger of explosion from too rapidly generating steam. When dry the flame may be turned on full and after about fifteen minutes the large brush-flame from the blow-pipe should be added, being careful only to keep it away from the pins of the facings. When brought to a red heat the investment should be drawn to the front of the fire and the flame of the blow-pipe cut down to about two inches in length, with just enough air to make a slight hissing sound. A very minute quantity of powdered borax may be thrown upon the gold at this time. The solder, being cut in long strips, should be fed in, directing the flame now upon the strips. If the investment has been carried to a full red heat, the gold is at a temperature sufficiently high to take the solder, and it is necessary only to melt the latter. The solder should be frequently dipped into the borax solution to keep it clean, and if that which has been melted into the bridge begins to crust a very small quantity of powdered borax should be added to it. If the gold cools down to such an extent that the solder will not attach to it, it is very unwise to direct a small hot flame upon a band in



order to force the solder. In such a case the investment should be re-heated to the proper temperature.

The practice of coating all parts with a thick borax paste and applying the solder in small pieces before heating is wrong. Such a quantity of borax at the beginning is not only unnecessary but objectionable. The tendency, as a rule, is to use too much borax, and this causes more checked facings than anything I know of. The gold in the investment does not oxidize so readily, it is the solder which should receive the flux. In applying the solder in small squares and numerous pieces at a time, it is quite easy to incorporate particles of borax which cause pits in the finished piece. The solder should be fed in from one side, and only as fast as it will flow of its own accord. That is, it should not be forced so that it folds over and carries down the oxidized surfaces.

When the solder in a bridge is solidified and it is necessary to add to it, the first should be brought to a complete liquid state before making the attempt, otherwise borax will be incorporated beneath the surface and pits result.

Broken facings are the result of three errors of manipulation, namely: burning borax into the porcelain, too close contact between the facings, and the rapid heating of the pins.

Borax burned into the porcelain lowers its fusing point and it actually burns, so to speak. The rate of expansion is greatest in the contaminated portion and cracks and checks result.

If facings are tight together when invested they have no room to expand when heated and fractures follow. It is often desirable to have the teeth quite close together in an anterior bridge. To avoid breaking the facings in such a case it is best to arrange them without regard for this point at first, then after having made a wall of plaster to preserve the original set-up, grind the approximal surface of each facing a trifle. The space obtained by a mere touch on the stone will not be noticeable but will suffice to allow the porcelain to expand without checking.

The sudden heating up of the pins is a very common cause for broken facings. The smaller bulk of metal heats and expands more rapidly than the porcelain. It is a bad idea to burn the wax out of an investment before placing it over the furnace, for a mere flash of the flame onto the exposed pins is enough to ruin the piece before the soldering is begun. The wax can easily be lifted out in one piece when the investment begins to warm up from underneath.

Facings seldom break from too rapid cooling. If they do break for this reason, however, it is because the porcelain contracts more rapidly than the pins, and this is an improbable occurrence where the tooth is embedded in investment.

## DISEASES OF THE ANTRUM OF HIGHMORE.\*

By Secord H. Large, M. D., Cleveland, Ohio.

I THINK you will agree with me when I say that you and I are receiving more cases of disease of the Antrum of Highmore than did the rhinologists and dentists of fifteen years ago. This is due, I think, to our more modern appliances for examination.

The question arises as to what is the greatest cause of empyema of the antrum of Highmore. You who see your cases, and are able to trace a sinus leading from a diseased root to the antrum, naturally will say that most cases of empyema are of dental origin; whilst we as rhinologists, when we are able by your report to exclude any pathological lesions in the teeth, will say that the infection takes place through the nose in a very great number of cases.

Nearly all of my cases of empyema of the antrum of Highmore are referred to the dentist for his opinion as to the condition of the teeth bordering on the antrum, and every year I am seeing more cases that have been referred to me by the dentists that they may be able to exclude any pathological lesions in the nose.

When you consider the position of the antrum with its opening in the upper part, you often wonder why we do not have more trouble in this cavity.

Any pathological lesion, especially if situated in the middle meatus, has a tendency to interfere with the drainage, and therefore causes empyema with its sequelae in the sinuses.

Speaking from the rhinologist's point of view, I wish to outline our methods of diagnosis of empyema of the antrum of Highmore.

The nose is divided into three parts, inferior meatus, which is bounded above by the inferior turbinate, below by the floor of the nose, the middle meatus bounded above by the middle turbinate. The middle meatus is the one which interests us, as it is the middle meatus that the antrum opens into. The frontal sinus and anterior ethmoidal cells also empty into the middle meatus, so if pus is found here it may come from any one of these sources, and diagnosis must be made by exclusion. The pus is removed by a cotton applicator, and the antrum is washed out with a normal salt solution, and if pus is mixed with the washings, we conclude that pus is in the antrum. We must exclude the anterior ethmoid cells and the frontal sinus, because the antrum may act as a reservoir for an empyema of these sinuses. The patient is allowed to remain in an upright position for at least an hour after the washings, and if there is no pus, we conclude that it likely came from the antrum. If there is pus, it in all probability comes from the anterior ethmoidal cells or frontal sinus, because the antrum of Highmore could not fill up and overflow in so short a time. By washing out the frontal sinus and finding no pus, we therefore exclude that sinus. The

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\*Read before the Cleveland Dental Society.

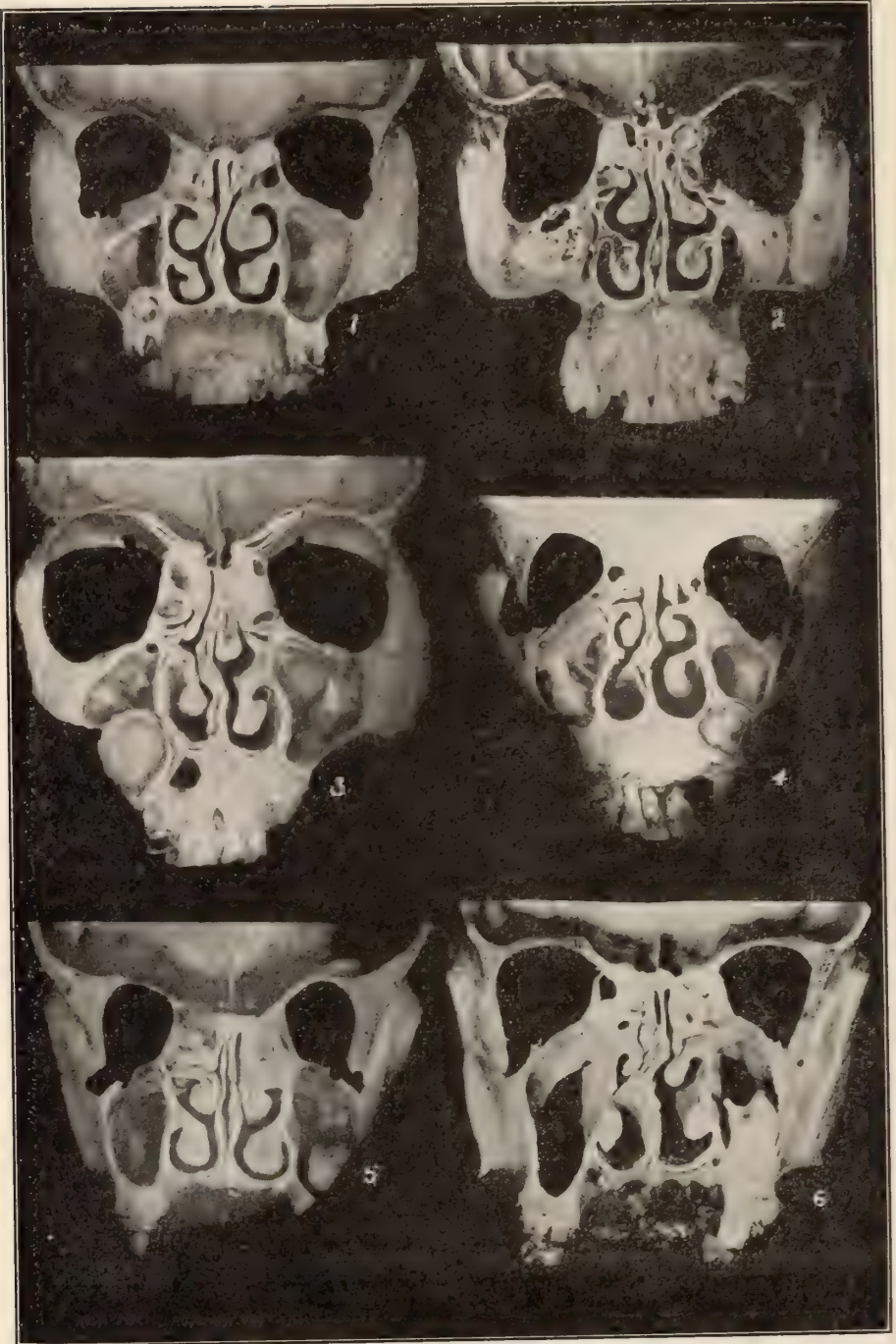


Fig. 1.—Cyst in the left maxillary sinus.

Fig. 2.—Osteo fibroma of the left antrum with narrowing of same.

Fig. 3.—Two dental cysts in the left maxillary cavity, causing reduction of same.

Fig. 4.—Cyst of the right antrum.

Fig. 5.—Polypus in the right antrum.

Fig. 6.—Inflammatory swelling of the right maxillary cavity due to a disease of the molar tooth.



anterior ethmoid cells are harder to exclude, but if the bulla ethmoidalis is enlarged we may suspect a disease of the anterior ethmoid cells, and we then must explore the cells.

To summarize: In empyema of the antrum of Highmore we have a history of pain over the malar bone; a quantity of pus from that side of the nose; pus in the middle meatus; the outer nasal wall bulges toward the septum, that is in the region of the middle meatus; tenderness on pressure over the antrum; washing out the antrum shows pus; on transillumination the affected side is darker; pain relieved after a free discharge of pus; X-rays shows opacity in affected side; frontal and ethmoids excluded.

By following the above, one can as a rule readily make his diagnosis.

One of the most prominent symptoms in cases of chronic empyema is melancholia, in fact three of my cases were on the verge of suicide.

One of the greatest questions for you and me to settle is, what is the best line of treatment? The first thing to do is to try to remove the cause. If it is of dental origin, it devolves on you as dentists to remove that cause; if it is due to some pathological lesions in the nose, or infection that has taken place through the nose, it devolves on the rhinologist to try and cure it by the nasal route.

My method of treating these cases has been, first, conservatively, and if they do not clear up then resort to radical methods. The conservative treatment consists in trying to establish drainage by treating the mucous membrane of the nose with mild antiseptics and astringents. I find that applications of cocain and adrenalin to the mucous membrane of the anterior middle turbinate to be the best drugs to control the inflamed tissues; this can be followed by a solution of antipyrin, which prolongs the contraction of the tissues. The nose is douched with warm normal salt solution, but in doing so the patient must be warned against allowing the head to verge to either side, as some of the solution containing pus might find its way through the eustachian tube, into the middle ear, and cause serious trouble there. Heat applied locally to the antrum gives great relief; asperin as a rule controls the pain, but we must sometimes resort to opiates.

On account of the cocain habit one must use this drug very cautiously. I never give a prescription to a patient for cocain.

The next step in the treatment is that of washing out the antrum. The needle penetrates the outer wall of the antrum through the nose, just below the inferior turbinate at the junction of its anterior and middle third; the washing should be done daily, and as the discharge decreases in character and amount the washing should also decrease. After following this line of treatment for two weeks, and the pus still remains, a larger opening must be made in the inferior meatus through the nasal antral wall. I think it is better to make it here than through the canine fossa or tooth socket. The latter is a very disagreeable one to the patient, as he always has pus flowing into the mouth; and I think there is greater danger of



Fig. 7.—Denker's modification of Luc-Caldwell operation.

Fig. 8.—Polypus springing from the middle meatus and large fibroma of the sphenoidal sinus.

Fig. 9.—Mucous membrane cyst in both antri.

Fig. 10.—Opposite maxillary sinuses.

Fig. 11.—Empyema of the Antrum of dental origin with destruction of its wall from pressure.

Fig. 12.—Empyema of the Antrum of Highmore due to dental origin, with destruction of its walls.

secondary infection taking place through the mouth than there would be if you had made a large opening into the nose.

All kinds of instruments have been manufactured to make this opening through the antral nasal wall: Curved saws, chisels, trocars, knives of all shapes, etc. The most important thing is that you make a large enough opening; through this opening the patient can wash out the antrum himself and one can make applications of various drugs, as the silver preparations, iodine, etc.

If this does not effect a cure, then we must resort to the radical operation, which consists in removing the anterior wall of the antrum, curetting out the diseased tissue and establishing a large opening into the nose, and then closing the opening in the canine fossa.

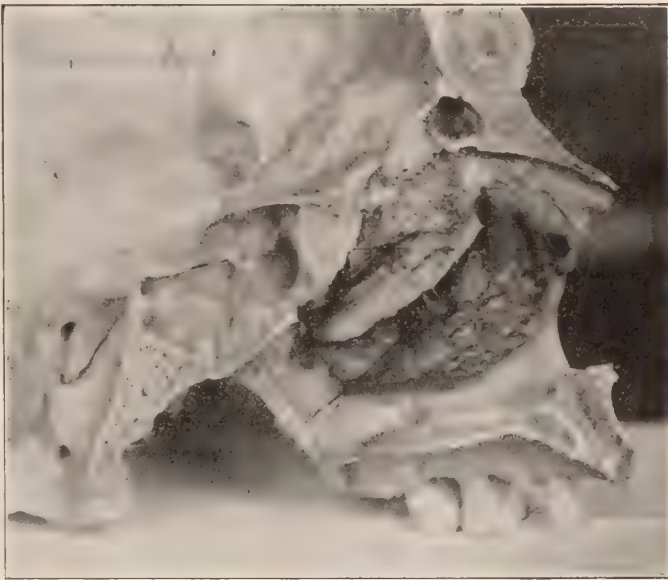


Fig. 13.—Accessory opening of the Antrum of Highmore.

When a case comes to me with a history that the disease has lasted a number of years, I advise a radical operation from the first, as I do not think conservative methods will do much good.

The disadvantage of the radical operation is, that it is a hospital one and means a general anesthetic, but my cases are generally up the second day and leave the hospital on the fifth or sixth day. The great advantage of the operation is that it generally cures. I am very glad to say that in the last fifteen cases in which we have done the radical operation only one has not been completely cured, and that one is so much better that he refuses to have anything further done.

This subject is such a large one — in fact a book could be written on it — that it is impossible for me in so short a time to go into it only in a superficial manner.



## THE PORCELAIN INLAY. ITS PRESENT STATUS AND WHY IT SHOULD BE MORE GENERALLY USED.\*

By W. L. Fickes, D. D. S., Pittsburgh, Pa.

PORCELAIN is the only material with which esthetic operations can be performed with any hope of permanency. It possesses more of the ideal characteristics than any other esthetic filling material. In many labial, buccal and proximal surface cavities, exposed to view, the porcelain inlay fulfills the requirements more perfectly than other fillings. If the principles of extension are properly carried out, the joint and margins perfect and other important details performed with skill, the porcelain inlay will save teeth exceedingly well. Its surface is cleaner than that of other fillings. It is almost a perfect electrical and thermal nonconductor, is inert to chemical and bacterial influences, and when properly fired is sufficiently strong to resist reasonable requirements of mastication. The principal reason why its use is limited is that it requires much skill and considerable time to construct and insert a porcelain inlay, and therefore it cannot be produced at small expense. Its field of usefulness is narrow, but it ranks with the other high-class fillings and excels them all from an esthetic standpoint.

There are a number of requirements for the manipulation of porcelain and the construction of inlays which have been much neglected, and yet they are essential to success. Inlays fall out principally because of the injudicious selection of cases, improper cavity preparation, lack of attention to the details of etching and cavity toilet, disintegration of the cement from stress, and the dissolving of the cement. They also fail because the operator does not understand the principles of color, manipulation of the body, chemical or physical changes from firing, or annealing. The reason why many men have not succeeded with this material is obvious. Many of the causes of failure are now known, a few of which will now be considered.

Considerable experience is necessary to determine the most favorable cases for porcelain inlays. Consideration should be given to such points as the esthetic effect; condition of the pulp; stress of mastication; the possibility of proper cavity preparation; habits of the patient, etc.

The resistance and retention forms of the cavity should be prepared with care in order that the inlay shall have sufficient bulk to resist stress and the greatest possible mechanical as well as adhesive retention. The margins should be made as strong as possible, considering the strength of enamel margins. When possible, the margins should be laid beyond the point of contact with occluding teeth. Care should be taken to thoroughly etch the cavo-surface of the inlay, neutralize the acid, boil away the wax, brush off the detritus left by the etching, and to dehydrate and cleanse

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\*Read before the Lake Erie Dental Society, 1911.

with alcohol and chloroform. The cavity should be carefully cleansed and the inlay set with a properly mixed, high-grade, adhesive cement.

The solvent action of the saliva on the cement has caused many inlays to fall out. This is usually due to imperfect adaptation of the matrix, or its distortion, or the inlay has not been properly set. The cement will dissolve out only to a slight extent from a perfect joint. The insoluble crystals in the cement, in a proper joint, prevent it from dissolving out to a depth that would endanger the filling. In such a joint the viscid saliva cannot enter to any great depth. Therefore failures from the solvent properties of the cement are primarily due to lack of skill on the part of the operator.

Contraction after firing distorts the matrix and fractures the inlay, if not properly controlled. Porcelain shrinks toward the center of bulk. Distortion of the matrix may be prevented by division of the body, thus causing shrinkage to several centers instead of to one common center; by the use of cores; by settling the particles of body closely together; by slow firing at a low heat; and in other ways. Breakage is less likely to occur if the proper attention be given to the differences in the coefficient of expansion.

Ability to imitate the various hues and tones of color of a tooth depends considerably upon our susceptibility to the many gradations of color. Teeth vary in color, but the tones are very light and the modifications are only distinguished by the trained eye. Owing to the optical difference between tooth and porcelain, it is impossible to obtain the same color effect under the varying conditions of light. Notwithstanding this objectionable feature, the porcelain inlay is the most artistic filling. This is especially true after years of service. The natural teeth change in color, but properly fired, high-fusing porcelain is inert to chemical action and remains unchanged in the mouth. A special study of color and considerable practice in the firing of bodies, in layers of varying thickness and gradations of hue and tone is required to make the operator expert in the production of well-matched inlays.

Broken margins often result from unskillful firing. Dental porcelain is properly fired when the maximum strength has been developed. It is not nearly so frail a material as seems to be indicated by our broken inlays of the past. The porcelain tooth has considerable strength and the porcelain inlay can be made equally strong. The strength of porcelain is in proportion to its high fusibility and the length of time it is fired. The color is burnt out and the material weakened by too high a temperature. Porcelain body contains sulphates, which decompose only at a high temperature, and the gas thus generated causes bubbles in the viscous body. A very high-fusing porcelain will become comparatively strong when quickly fired, but the low-fusing inlay body should be fired for a longer time at a lower heat than has usually been the custom. Probably as many failures have resulted from quick firing at a high temperature as from any other cause.

Porcelain inlay operations should be performed by all dentists who aim to please people of taste and refinement. There is no other class of fillings for which the operator will receive more gratifying praise. Then why is porcelain not used to a greater extent? The answer to this question has already been given, viz: because of the skill and time necessary and the consequent fee required. The public should be trained to a proper appreciation of our services, and the latter objection would be removed; and as to skill that is only a question of attention and qualification. If porcelain were only used when indicated, in labial, buccal and proximal surface cavities, and in an occasional favorable cavity involving the angle of an incisor tooth and all the essential details of cavity preparation, adaptation of the matrix, manipulation of the body, firing, annealing, etching and setting were skillfully attended to, the only serious objection to the use of the porcelain inlay would be the skill and time required in its construction.

### GOLD FILLING.\*

By O. L. Hertig, D. D. S., Pittsburgh, Pa.

**A** PERFECT gold filling, placed in a properly prepared cavity, is an achievement worthy of the skill of any man.

The attainment of adequate skill has been such a difficult proposition that innumerable schemes and devices have been invented in order to bring the operation within the range of mediocre ability. Nothing has been found to supplant the gold filling, consequently operative dentistry presents many serious problems to the mediocre man.

The gold filling has two serious drawbacks—the unsightliness of large restorations in anterior teeth and the immense amount of strain, to both patient and operator, incident to the placing of large posterior contours.

Necessity gave birth to the inlay, both of porcelain and gold. These two devices have been tested and have earned a place of importance among filling materials.

In no walk of life are common sense and good judgment at a higher premium than in the practice of dentistry. Eight out of ten dentists are enthusiastic extremists who learn, not by the employment of artistic and mechanical discrimination, but by repeated failure.

Six years ago the dental journals and society programs were full of porcelain inlay talk. Inlays were placed in all conceivable places, regardless of the indications. Gold was dethroned, and porcelain was king. However, Time, the impartial arbiter of all things, has adjusted matters, and porcelain has been assigned to its small but important place in the field of filling materials. Today the gold plugger lies in its case, unused, rusting for lack of proper appreciation, while casting machines of all possible shapes and kinds are whirling, throwing, sucking, plunging and thrusting

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\*Read before the Lake Erie Dental Society, 1911.



molten gold into all sorts of molds, busily engaged in turning out the maximum number of inlays with the minimum amount of work.

Time, the arbiter, has another job on his hands, and six years hence will see the gold inlay occupying its legitimate place among restorative measures.

This symposium is not to be a debate concerning the respective merits of the three subjects, but rather a harmonious discussion of when and where to make use of various forms of fillings. Such a lack of judgment has been shown by the rank and file of the profession, in the use of both porcelain and inlaid gold, that this discussion, to my mind, is very much in order. The easy way to do good dental work has not been found, for the inlay demands as much of the operator, in the way of skill and painstaking detail, as does the building of restorations with foil.

I shall devote the remainder of this short paper, not to a consideration of the technique of foil manipulation, but to a summarizing of the classes of cavities where malleted gold is the best material to use. Gold foil fillings are indicated in *all* simple proximal cavities, in the six front teeth where the labial exposure is not so great as to be unsightly. As a rule, access can be had from the lingual surface.

The same material should be used in the majority of incisal angle restorations, for in these cases the stress from contact with the lower teeth is usually so great that the maximum of strength must be possessed by the filling. The treatment of labial surfaces with gold is contraindicated.

Now when we come to the molars and bicusps, the time consumed by the operator in making a *perfect* filling must be taken into consideration. Pit and fissure cavities are very easy to fill, and proximo-occlusal cavities of average size represent ideal places for the use of foil; but the treatment of large cavities, requiring the insertion of those immense posterior restorations which usually prove so nerve-racking to both parties, should only be done with foil by one who has developed a celerity of manipulation quite out of the ordinary. No patient should be kept in the chair more than two and one-half hours at a sitting.

In short, all inconspicuous and accessible cavities ranging in size from small to fairly large can be best filled with gold foil.

Certain conditions, namely, inaccessibility, impossibility of adjusting rubber dam, oversensitiveness of pericementum to condensing force, and prohibitive size, contraindicate its use.

Up-to-date colleges are teaching the use of gold foil as a filling for properly prepared cavities, more efficiently and exhaustively than ever before, recognizing in the filling of malleted gold the possibilities of operative perfection.

The young graduate who fails to perfect himself in the wielding of the mallet and plugger makes the mistake of his life. The mallet and plugger constitute the basis of tooth salvation. Around this basis all other devices cluster as simple auxiliaries.

## THE GOLD INLAY AND A PLEA FOR ITS MORE CONSERVATIVE USE.\*

By L. B. Moore, D. D. S., Pittsburgh, Pa.

Prof. Clinical Dentistry, etc., Philadelphia Dental College.

**F**IND from looking over current literature on the subject that some of the most enthusiastic of our malleted filling operators see a great future for the gold inlay. Especially is this true since the adoption of the disappearing model method introduced in recent years; though by no means do they accept the haphazard way in which it is being used by many operators today. Experience has taught them many of the things that are necessary to obtain a permanent result in any of the filling materials used to restore the lost portions of teeth. The consensus of opinions is that if the proper care be taken in selecting the cavity as to location, and that the requirements of the tooth structure as well as the relative immunity can be taken care of, that there is a great field for the gold inlay.

The gold inlay is indicated where the operator's judgment prompts him that there cannot be placed in the cavity any other filling material that will do so much toward the preservation of the tooth. Some men no doubt can place malleted fillings with comparative ease where only failures would result if attempted by others; for instance: Disto-occlusal fillings in lower bicuspsids and molars. The gold inlay would probably be better in these cavities provided the operator does not possess such skill. The gold inlay is also indicated in disto-occlusal and gingival third cavities in bicuspsids; in all cavities in molars, except buccal pit cavities; in cavities where large contour amalgam fillings or crowns seem the only alternative and where other filling materials of equal value in preserving qualities cannot be placed without great nervous strain upon the patient.

The gold inlay should not be placed where it would be necessary to sacrifice any great amount of tooth structure, as on approximal surfaces of the anterior tooth and pits on the lingual of incisors and buccal of molars; in fact, in no cavities in the anterior teeth where foil can be perfectly placed, or where porcelain would be indicated for the esthetic effect.

It must be remembered that there are certain fundamentals in the preparation of cavities. The enamel walls must have all of the enamel rods supported by sound dentine, to insure permanent results from any filling material, and to accomplish this the walls should in their correction, have on their outer one-fourth, a 6 to 10 degree centigrade bevel.

Resistance form should consist of approximately parallel walls and fiat seats; although the walls and seats should not meet with definite point and line angles, but should be slightly curved or rounded to prevent the pocketing of the cement, which tends to prevent the gold inlay from being properly seated.

No doubt the retention depends somewhat upon the resistance form. The most important factor in retention of the gold inlay is the adhesive

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\*Read before the Lake Erie Dental Society, 1911.

property of the cement, therefore, improper toilet of the cavity has been the cause of many failures; the cavity should be dehydrated and dehydrated in order to obtain the greatest adhesion in cements.

The walls should slightly diverge toward the margins of the cavity to insure convenience in the removal of the model that it shall not be distorted. There should be no undercuts, nor should the walls be wide flaring ones, but they should be approximately parallel and at right angles in dentine.

Undue pressure allowed to be brought upon the filling after it is placed, will, in the hammering during mastication, break up the crystalline structure of cement and will in a short time cause it to fail.

The modern methods and technic of construction of the gold inlay have been a boon to those operators who could not properly place a foil filling. The laity demands a certain amount of it on account of the easy method to patient and time saving advantages. This, no doubt, is causing many inlays to be placed where they are not indicated. However, the patient's demands should not cause any operator to reject all other materials, yet I have heard some members of the profession say that they have not placed a foil filling for a year or more. In my mind the gold inlay is the hardest filling to construct, with good results, that we have. There is no certainty as to the result until it is placed, owing to a lack of knowledge of the materials used in the technic during its construction, or of suitable equipment to control the few physical properties of the materials as indicated by investigators along research lines.

A suspicion as to the value of the gold inlay is becoming prevalent among the more intelligent patients on account of failures. Many will not allow the placing of this valuable filling even though no other filling is indicated in the mind of the operator. Therefore, great care and discretion should be used in selecting cavities in which to place gold inlays to prevent too much public criticism, or the result will be that the gold inlay will be placed in the same position as the porcelain is today.

There is no better filling than a perfect gold foil filling, none more esthetic than the porcelain inlay, and none more serviceable than a properly contoured, good-fitting, gold inlay where the inlay is indicated. However, it is unfortunate for the gold inlay that, in the majority of places where indicated, the loss of tooth structure is so great that only a reasonable amount of service could be expected of it, and scarcely any service from other materials.

**A quiet life often makes itself felt in better ways than one that the world sees and applauds; and some of the noblest are never known till they end, leaving a void in many hearts.—Louisa M. Alcott.**



## SOME ILLUSTRATIONS OF THE FOUNDATION AND SUPERSTRUCTURE OF CROWNS.\*

By Thomas E. Weeks, D. D. S., Philadelphia, Pa.

Prof. Clinical Dentistry, etc., Philadelphia Dental College.

Every one recognizes the value of system in the doing of anything. The object of this paper is to suggest a systematic procedure, step by step, in crown and bridge-work. The charts and the models to be shown are arranged to illustrate these steps, *seriatum*.

In the preparation of a root for a crown, after the canal has been filled properly and we are assured of the health of all the parts concerned, we first remove what remains of the crown, leaving the stump long enough for any kind of attachment that may subsequently be decided upon. Second, enlarge the canal. This enables us to decide whether the canal will accommodate a dowel having sufficient length and bulk to support the crown against the stresses to which it will be subjected. Third, prepare the root properly to present a firm seat for the crown. If no band is employed a rim of enamel about one millimeter wide will be left completely encircling the root. This removes any danger of wounding the soft tissues at the gingival line. If a band is decided upon, remove *all* of the enamel and fit the band to the root *before* the final preparation of the root end.

These are the steps preparatory to "laying the foundation." Whether the foundation is to be a dowel with "cope" or a dowel with banded cap, this basis work must be done first; no matter what style of crown is to furnish the superstructure. It is true that this rule is slightly modified if the crown is to be made or attached by the casting process.

In determining the kind of porcelain to be used we must consider, besides the artistic requisites, the characteristics of the remaining teeth, the manner of occlusion and the amount and direction of stress.

Having decided upon the superstructure best suited to the case in hand, we proceed with its construction in the same methodical manner. The exhibit and demonstration are intended to illustrate the various procedures enumerated; also to show the application of a large variety of the porcelains offered by the manufacturers by the casting process.

In the all-porcelain crowns attached by a dowel and cope or a dowel and banded cap, there are "detached dowel crowns," "diatoric teeth," "Steele" and "Evslin" bicuspid. In the porcelain faced metal crowns there are the "long pin flat backs," "Steele" and "Evslin" facings.

There are also comparisons of the right and wrong application and relation of the porcelain to the metal. There is also shown the steps in the construction of hollow metal crowns by an accurate and simple method of carving, modeling, swaging and soldering, also by the casting process. An accurate and simple method of producing models upon which crowns

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\*A preliminary explanation of the Table Clinic given under the above caption before the Ohio Dental Association.

or inlays may be constructed, without the presence of the patient, after the root or cavity is prepared and the impression taken; the work being done entirely in the laboratory.

The work is presented in this manner in the effort to show the superior value of a clinic where the members may have, in advance, an intelligent idea of what the clinician is endeavoring to show before they inspect the exhibit or view the demonstration. The value of charts will also be apparent. Your clinician claims no originality in the presentation or in the various operations shown, but if one point or one new thought is brought to any of his friends in the Ohio Dental Society he will be content.

I desire to acknowledge my obligation to my assistants, Mr. Charles B. Addie and Mr. Fred C. Tanner, for their invaluable aid in preparing this exhibit.

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### VITALITY A FACTOR IN DENTAL CARIES.

By D. W. Barker, M. D. S., Brooklyn, N. Y.

**D**R. E. C. KIRK, in his paper on the "Question of Susceptibility or Immunity to Dental Caries" (*Cosmos*, July 1910), shows that in all the history of literature of the subject it has always been dealt with from the physical standpoint: that there are no factors which cannot be seen and measured. Dr. Kirk's reputation for thoroughness and carefulness is an assurance that his resumé of the subject is exhaustive.

It is now about ten years since Dr. Black announced his theory of "environment," which in brief is that the sanitary or unsanitary conditions of the teeth—their environment—is the only factor to be considered; that the quality of tooth structure has nothing to do with it; that there are no poor teeth so far as liability to decay is concerned. This idea was based upon the fact that analysis of dentine and enamel show that the proportions of the constituent elements do not vary and hence, as there is no difference inside the teeth, the only difference must exist outside of them, viz: in their environment. It is assumed that there is no factor which cannot be seen or measured or weighed, but this is at variance with the observed facts and patently fails to explain all the phenomena of tooth decay. That there *are* soft teeth and that these soft teeth, though clean, *are* sometimes more susceptible to decay is a fact apparent to every one no matter how loudly and persistently the contrary is shouted. That filthy teeth sometimes do *not* decay, though surrounded by an environment ideally perfect to produce such result is also equally apparent. If such cases were exceptional or rare the argument would lose much of its force, for they might be explained by causes incident to each particular case, but they can be duplicated by the score in every practice in the land. Therefore, since "environment" so obviously fails to account for all the facts it cannot be the solution of the problem.

Dr. Flagg used to talk a great deal about the "quality of tooth structure"; the phrase occurs frequently throughout his writings, and it

seems probable that he thought that was the principal factor; but Dr. Kirk shows that the difference between hard or soft teeth (i. e., "quality of tooth structure") cannot wholly account for it either, though he concedes that it is a factor in the problem.

If "environment" and "quality of tooth structure" does not account for all the facts, there remains then one factor which heretofore has not been considered, viz.: the vitality of the tooth itself. Nowhere does Dr. Kirk refer to any investigator who even mentions it. By "vitality" I do not mean "life" merely. I mean the power to resist and overcome disease which every cell, organ and tissue possesses as long as it has life. If I called it recuperative power, vital energy, or power to respond to stimulation, perhaps it may make my meaning clearer. It cannot be seen with the microscope, nor weighed, nor measured, nor will it respond to chemical test. It is invisible, intangible, imponderable, yet a very real force. We deal with it and rely upon it in our daily work in every way, and the whole practice of prophylaxis is based upon it; without it all our work fails; and yet when our wise men attempt to solve the problem as to why teeth decay or do not, they ignore vitality and leave it out of their calculations.

Not long ago I examined a man's teeth which were inexpressibly filthy. All the kinds of bacterial plaques known to the microscope could be found there. The environment for decay was ideal and yet no decay. We have all seen such cases; they are common. On the other hand, I have a patient only fourteen years old who has lost all his bicusps and molars and the anterior teeth have extensively decayed, and yet the remaining teeth were clean. The enamel is as thin as paper and friable as glass, and the dentine like punk. All the "extension for prevention" in the world could not save those teeth with gold, as every sensible man knows. It is the failure of the environment theory to account for such facts as these that causes it to fall to the ground.

As I have shown, all theories omitting vitality fail to meet the requirements and fall to the ground like a two-legged stool. Let us see if vitality accounts for the phenomena. If it does not it, too, will fall. What are the causes of susceptibility or immunity to caries? Three—vitality, quality of tooth, and environment. The existence of vitality cannot be denied, then why not count it among the forces that make for or against disease? It varies in different individuals just as the other factors vary, and susceptibility to or immunity from decay will be found just in proportion as these factors are present or absent. For instance, the first case cited above; a man of strong vitality with extremely hard teeth—no decay though bad environment; the second, a boy of weak vitality and poor tooth quality, extensive decay, though environment good. These two cases represent the extremes; the others fall in between. Hence extension for prevention is successful in teeth of good quality and strong vitality (i. e.,



those that need it least) and fails in teeth of poor quality and weak vitality (that need it most).

**VITALITY!** We are born with a certain amount, and when it is exhausted we die. Every cell possesses it and when it is gone the cell dies. It varies with each individual and in each individual at different times. Hence the greater susceptibility to caries at times. Not long ago a prominent clergyman of this city died at the age of forty-five of senile decay—a low vitality, the physician would say, while some frail woman lives to a hundred and endows scores of descendants with her own virile force. It is probable the whole practice of medicine is based upon this power to respond to appropriate stimulation, for when the patient does not respond to treatment he dies; it is just the same with a tooth.

As nothing is ever really settled until it is settled right, so before we reach the final answer we must give due weight to this unseen force—vitality.

### SYPHILIS IN DENTISTRY\*

By Starling S. Wilcox, M. D.

Lecturer on Genito-Urinary Diseases, Starling Ohio Medical College, Genito-Urinary Surgeon to Grant and St. Francis Hospitals, Columbus, Ohio

(Continued from page 849, December Summary)

Tertiary Manifestations of interest are those involving the tongue, hard and soft palate, nose, and the skin eruptions.

Sclerosis of the tongue develops after the fifth year, and generally appears upon the dorsum. It may be superficial or deep. If superficial, it produces a parchment-like induration which may be circumscribed or fused, and is prone to ulcerate when irritated. If deep, the process may



Fig. 16—Syphilitic sclerosis of the tongue.

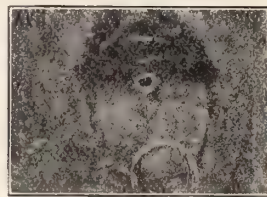


Fig. 17—Gummata of the tongue.

penetrate to the muscular tissue, and the tongue may be greatly increased in size but, after a time, the newly formed fibrous tissue retracts and the organ becomes atrophied. The edges of the tongue receive the markings of the teeth and, as retraction takes place, the tongue is divided into islands, separated by deep fissures, which can not be effaced. Ulceration may ensue from irritation and injury.

Specific sclerosis is distinguished from the non-syphilitic affection by the formation, in the latter, of longitudinal whitish bands, producing contraction and deformity.

Sclerosis may be mistaken for cancer.

Cancer differs from specific sclerosis inasmuch as, in the former, severe pain is present and the ulcer, which dips down into the tissue, unlike the ulceration of syphilis, stands out as a decided tumor and bleeds readily. Cachexia is present and there are no multiple points of ulceration.

Gumma of the tongue may be superficial or parenchymatous. The superficial variety commences as small nodules which soon ulcerate. The ulcer has perpendicular walls, infiltrated base, and its floor is covered with a yellowish-white film.

The parenchymatous or deep variety also begins as small nodules in the muscular tissue of the tongue. They undergo degeneration and finally the mucous membrane covering them ruptures, leaving a deep cavity, with sloughing undermined walls surrounded by an indurated areola.

Gumma of the tongue may be mistaken for epithelioma and tubercular ulcer. For the sake of comparison the characteristic features of each lesion will be given.

Gumma appears far back upon the dorsum and is often multiple. It is preceded by a deep node. The ulcer begins in the center of an indurated mass and increases rapidly. It suppurates like a boil. The ulcer is excavated and there is pain only on motion. Its borders are thin, abrupt; its edges are undermined, and it appears as a grayish adherent mass. There is surrounding swelling and redness but no bleeding. The anatomically associated glands are rarely enlarged, and there is no cachexia. The affection may occur at any age.

Epithelioma of the tongue usually appears upon the border, to one side, or it may be on the under surface. It appears as a warty growth and is followed by woody hardness. It increases slowly as compared to the gumma and develops a foul ulcer with an ichorous discharge. The growth is in relief, standing out as a fungoid tumor, and the pain is spontaneous and of a lancinating character. The borders of the ulcer are thick, spreading, irregular and elevated, with a reddish or yellowish base. The growth yields small drops of blood upon pressure. Cachexia is present, and the tumor usually appears late in life.

Tubercular ulcer of the tongue occurs upon the tip, and is usually single. There is no preceding node or tumor, and the ulcer begins on the surface with little or no induration. It progresses comparatively slowly, and there is less suppuration. The ulcer is not elevated and in relief, but flat and tender. Its edges are beveled and jagged and the base is pale, flabby and pinkish or yellowish in color. There is no bleeding, unless from injury. The glands are not infrequently enlarged and there is often obtained a family or personal history of phthisis, and the affection usually occurs in early adult life. If the ulcer heals, it has a tendency to break open again.

Gummata of the hard and soft palate are of the same character and have the same insidious beginning as gummata of the tongue. Their great

importance lies in the destructive course they pursue. In a short time they may destroy tissue and bone, leaving deformities which once seen can never be forgotten. These deformities often tax the surgeon to the utmost, and it often becomes necessary for the dentist to make plates to cover the fistula leading into the nasal cavity.

Gumma of the hard palate begins, usually, in the median line, and an abscess is soon formed, which ruptures and exposes the bone. After separation of the sequestrum an opening is left between the nose and the mouth which greatly interferes with articulation and deglutition but which, in time, decreases markedly. Associated necrosis of the alveolar process often occurs, affecting the upper jaw near the central incisor teeth, and as the disease extends the teeth loosen and drop out.

Gumma of the soft palate begins insidiously. There may be no premonitory symptoms. Suddenly, the voice becomes changed into a nasal whisper, and attempts at swallowing liquids or solids are followed by regurgitation through the nose.

The lesion commences in either of two ways: first, a circumscribed deposit takes place between the buccal and nasal surfaces of the soft palate; second, there is a diffused infiltration of the entire velum, its mucous membrane becomes reddened and its mobility impaired. Rupture of the abscess or ulceration of the infiltrated tissue may involve one or both mucous surfaces, thus causing partial or complete perforation of the soft palate.

Syphilis of the nose is followed by great deformity. Gunmata are commonly found on the septum, the floor of the nostrils, the posterior nares and the turbinated bodies, although they may appear at any point. Deep destructive ulceration develops, and there is loss of tissue, followed by characteristic scars.

Fibroid degeneration is most often seen in the depraved underworld class. It attacks by preference the turbinated bodies, which become enlarged, dense, hard and of a yellowish white or red color. The turbinated bodies are frequently converted into sessile fibroid polypi, which obstruct the nasal canals.

Destruction may be limited or complete. In the latter event, perforation and necrosis of the palatine roof occurs and the process may attack the brain and cause death.

Tertiary skin eruptions to be considered are those which, owing to lack of treatment, susceptibility of the patient, or unusual virulency of the disease, appear earlier in the cycle of events than usual and, therefore, may be capable of transmitting syphilis.

There are several varieties of the tertiary type, but only those likely to appear upon the face and neck will be considered.

The tubercular syphilide resembles the papular eruption of the secondary stage, with added thickness and chronicity. The lesion may appear at first as a sharply defined conical or rounded tubercle; or second, as a more or less elevated, flat, sharply circumscribed and often scaly patch.



The conical or rounded tubercles vary in size from one-third of an inch to an inch or more in diameter, and are deeply seated in the derma. They begin as pinkish or dark-red spots and, eventually, become deep circumscribed tubercles of a pinkish, red, coppery, or brownish-red color.



Fig. 18—Guma—soft palate.



Fig. 19—Tubercular syphilide.

On the face they have a smooth shining surface with little or no scaling. They may, at times, coalesce and form a patch which rapidly increases in size along its circumference, while atrophy and absorption take place at the center, producing an elevated circle enclosing a central depression of atrophied tissue.

The sharply circumscribed patch commences as a small red spot, which increases in size from one to two inches in area. The tubercles are slightly elevated and look like patches of thickened and reddened skin,

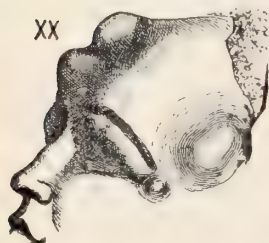


Fig. 20—Guma.

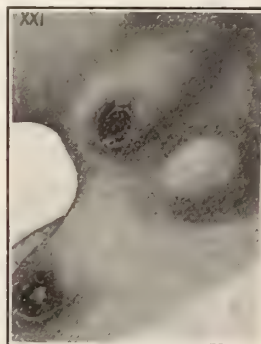


Fig. 21—Ulcerating and solid guma of the neck.

covered with scales and surrounded by a narrow areola of redness. Exceptionally, they form circles and not infrequently, under irritation, ulcerate.

The gummatous syphilide is composed of a small number of lesions whose course is slow and painless. When the lesions are subcutaneous they appear as tumors, but if they ulcerate and involve the skin they are

called gummatous ulcers. The lesion commences as a painless movable nodule, about the size of a pea, situated beneath the integument. As it increases in size it forms adhesions with the skin. The integument is at first red but, finally, becomes coppery colored and much thickened.

The lesions are prone to develop in groups and may either fuse together or remain isolated. The tumor may remain solid for weeks, finally undergoing resolution, or it may ulcerate. This syphilide may develop on the scalp, face, forehead and neck.

The rupial eruption is an ulcer which covers itself with a scab. Beginning as a hyperemic spot, it forms a flat greenish-brown crust, surrounded by a line of ulceration. The secreting surface, under the first crust, forms another, then the third is formed under the second, and so on, producing a laminated scab. Each lamina being larger than the one covering it, a truncated cone is formed. The rupial lesion is compared to a dirty oyster shell growing from the skin. Such a lesion is almost self evident.

While the foregoing curtailed description of some of the lesions of syphilis may be of practical value, it must never be forgotten that the dangerous patients are those who present themselves without visible signs.

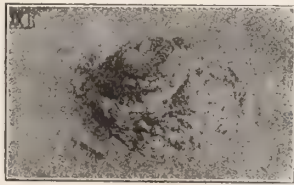


Fig. 22—Rupial Syphilide.

They may be divided into two classes. The patients of one class, having acquired syphilis, come to have their teeth put in order. A request for "general repair work," especially from a stranger, should at once arouse suspicion. The physician has advised the patient to have his mouth put in order preparatory to a prolonged mercurial treatment, and at the same time has impressed upon him the importance of informing his dentist of the true state of affairs. He may go to the family dentist or to a strange dentist, and may or may not tell him that he is syphilitic. If the patient admits that he is syphilitic the relationship between him and the dentist should be sacred.

Regarding the second class: it will not be difficult to detect mouth symptoms in patients who are taking large doses of mercury. The gums will be puffy, engorged, higher colored than normal, shiny, and oftentimes the taint of the drug can be detected upon the breath. Again, in those cases where the disease has not shown itself for months and the patient has stopped treatment, perhaps temporarily, and there are no evidences of mercurialization nor symptoms of syphilis, the gums will show the effect of the mercury previously taken. This is especially true if the drug has been pushed to the danger line of salivation. The gums will have re-

tracted, leaving a condition similar to pyorrhea alveolaris, differing from that disease, however, in that the teeth, while loose and free from the gums, the roots are not covered with tartar nor surrounded with pus. The breath may be offensive from decomposed food lodged between the teeth and gaping gums, but the odor is not characteristic of alveolitis.

The condition of the teeth and gums, just described, may be present in late syphilis, due to the disease, but when seen in early syphilis (first three years) it is more apt to be due to mercury than syphilis.

If the mouth shows the effect of long continued mercurial treatment, it is fair to presume that the patient is syphilitic; otherwise, why the continued use of mercury?

I have seen cutting of the gums, especially between the lower central incisors, sufficient to destroy the frenum, occur from as small a dosage as one grain of the protiodide daily. If medication is continued the lower



A—Early stage of epithelioma of the lip.



C—Tubercular ulceration.

teeth become loose and the gums retract. After the drug has been withdrawn the teeth tighten but the gums remain more or less deformed.

In conclusion, I will remind you that few patients call upon the dentist while suffering from active mouth symptoms for fear of detection, and in view of the appalling increase of syphilis in all classes, the dentist should safeguard himself against every patient who sits in his chair.

Dexterity of manipulation and surgical cleanliness are essential to the protection of both dentist and patient.

Dexterity of manipulation, one of the greatest assets the dentist possesses, should be cultivated to the last degree. This is not only for the comfort of the patient but for his and the dentist's safety. During manipulation there should be no unnecessary abrasions. If a wound of any character be received, massage of the point of injury with a ten per cent calomel-lanolin ointment for five minutes should be resorted to at once. It has been stated that rubbing in of this ointment may prevent syphilis if applied not later than eight hours after inoculation.

In regard to self protection, the dentist should exert every effort to keep his hands and fingers in the most exquisite condition. There should



be no hang nails nor callous spots, with radiating cracks and fissures to absorb the contaminated saliva adhering to the rubber dam, cotton, napkins and instruments used. It would be a paying investment to employ a manicurist at regular intervals, a procedure which would add to the general comfort of all concerned. The fingers, when moistened with the patient's saliva, should not be wiped upon any part of the operator's clothing, but washed thoroughly and dried upon a towel; otherwise some of the virus left behind might, during the next act of wiping, be picked up again by the dentist's fingers and transferred to his second patient.

There is no particular reason why a dentist should not care for the teeth of a patient known to be syphilitic. It is only necessary to follow the rules of asepsis and avoid giving or receiving an injury, or the absorption of the virus by actual contact. For the safety of patients, towels, tidies, and all soft material likely to be used again should be sterilized.



D—Flattening of the nose from destruction of the cartilaginous septum.

The covering of the head rest should, in every case, whether the patient is known to be syphilitic or not, be changed. A sterile towel will answer the purpose well.

All instruments, drinking glasses, mouth mirrors, impression trays, moulds, the big knife used in plaster work, in fact any object likely to become contaminated, should be rendered sterile. This can be done if the dental office is furnished with gas or electricity. In either event a convenient sized sterilizer with a steam compartment can be placed on a wall bracket and the heat applied. Heavy and sharp-edged instruments, such as chisels, forceps and mouth gags, can be wrapped in gauze and boiled in the water in the lower receptacle of the sterilizer, which furnishes the steam for the steam chamber. After boiling, they can be removed, wiped dry and stored for future use in sterile towels.

Cutting and delicate instruments can be rendered sterile by immersing them in a solution of green soap for twenty minutes, rinsing in sterile water, wiping dry and placing in a sterile glass tray, filled with C. P.

alcohol, until required. All instruments not used can be placed in sterile towels and kept upon the shelf ready for future use.

Another way to render delicate instruments sterile is to soak them in a solution of green soap for twenty minutes, wash and dry, dip in pure carbolic acid, rinse with alcohol, clean with sterile water, wipe dry and store away in sterile towels.

Towels, cotton, gauze, napkins, in fact all soft material used in the work about the office, can be put up in conveniently sized bundles, covered closely with unbleached muslin so as to exclude the air. Each bundle is subjected to steam sterilization. Each bundle can then be stored, in the original package, for future use. Rubber goods can be rendered sterile by scrubbing with a solution of green soap, cleansing with sterile water (boiled water) and immersing in a solution of bichloride, 1 to 5000. The bichloride solution can be rinsed away with sterile water just before the articles are to be used.

To emphasize the importance of asepsis being thorough in every detail I will refer to one way in which the aseptic chain can be readily broken. The receptacle with little perforations for holding cotton for immediate use is as dangerous as convenient. Should the dentist's fingers be contaminated with the syphilitic virus, in his manipulation to withdraw a portion of the cotton, the holder and the remaining cotton are sure to be smirched. Naturally, before the next patient comes to the chair, the dentist washes his hands—not forgetting to use a delicately perfumed soap—and rearranges his table and instruments, forgetting or perhaps not knowing that he has contaminated the metal box and the contained cotton. His second patient requires the use of cotton, and he reaches over and pulls out the desired amount. His fingers come in contact with the germ laden holder and carry away cotton impregnated with the virus. This comes in contact with the patient, and if there is a break in continuity the virus will be absorbed and syphilis will follow. To avoid this calamity the cotton previously sterilized should be removed from the surgically clean receptacle with sterile forceps. The cotton can be placed on a sterile towel and the forceps still remain clean. In this way asepsis is maintained. Or the cotton and box may be sterilized before and after every patient, whether known to be syphilitic or otherwise. The little details are what count in maintaining surgical cleanliness, and the method of taking care of the cotton holder may be applied to other articles of the dentist's armamentarium.

The work room should also come into the limelight and unnecessary dirt cleaned away. The towel hanging over the tap should be sterile and the tap itself covered with sterile gauze. A chain is as strong as its weakest link and should there be a break in asepsis infection may follow, often from a source impossible to discover, and criminal negligence rightfully charged.

## INDIRECT ADVERTISING IN THE PROFESSIONS.

By A. F. Sheldon, Chicago, Illinois.

THERE are two kinds of advertising: direct and indirect. The merchant may use both; but the ethics of the professional man limits him to the latter—*indirect advertising*.

As this article is to be published in a professional journal, we shall treat of *indirect advertising only*.

As advertising falls under two heads, *indirect advertising* falls under two general heads or classes. First, that done by one's self; second, that done by others.

Under the first head falls: First, one's social relationships, which, broadly speaking, includes the acquaintances one makes at the club, at social gatherings of various kinds, in athletics or sports (for those who take part in them)—in fact, wherever men and women meet together for pleasure, recreation or culture.

These social and friendly relationships often lead to business—in fact can be made to lead to business provided the professional man is an adept or a master in the art of making friends. This he should be if he desires his profession to be a paying one.

Under the second head falls: The rendering of public service so as to make yourself well known in the civic walks of life. Take part in some progressive movement—some good cause: become a leader in it if possible, and the service you render the public will be repaid to you from a business or professional point in the *indirect advertising you get*.

Let me give an example of just what I mean. At a banquet in Chicago I once had the privilege of sitting by the side of Mr. Harry Wheeler, the vice-president of one of our banks in Chicago; a man active in the Association of Commerce work and various other organizations which are for the good of the whole community. I could see that Mr. Wheeler was taking a great interest in the Associated Charities of Chicago. He was then enlisting the services of able business men to take up a campaign in behalf of the Associated Charities. Mr. Wheeler is not the kind of man to sit back and tell the boys to go on. He says, "Come on, boys," and he goes down the line of business houses soliciting their active cooperation.

He is not doing this for the sake of making money. He has no thought of that. But, do you know, when Mr. Wheeler is doing that kind of work he is a splendid advertisement for that bank of which he is vice-president.

The reason for this is plain when one comes to realize that confidence is the basis of trade—is the basis of the patronage that the client gives to the lawyer or the patient to the doctor or the dentist—and one has more confidence in the man who is taking part in that kind of work than in one who is looking after his own interests all the time with no thought of others.



He profits best often who serves the world with no thought of gain. He gains the favorable attention of other men by rendering unselfish service. Without seeking it, he gains *indirect advertising*.

Now, since the ethics of the professional man limit him to *indirect advertising*, then to become *successful* does it not follow that he must master that form of *advertising*?

How is he to do this?

He must develop a magnetic and dynamic personality; which is to say he must *develop his service-rendering power*, and make the *world know he has it*.

How?

By developing the Ability of his intellect, the Reliability of his feelings, the Endurance of his body, and the power of Action of his will.

This is the AREA *idea*.

A for ABILITY,

R for RELIABILITY,

E for ENDURANCE,

A for ACTION.

Ability is a professional requisite. For what person would go to the doctor or the dentist for treatment, or entrust his law-suit to the lawyer, if he did not feel the professional man for whose services he was paying knew his business? If he found out afterwards that the man he had favored with patronage lacked ability, would he return to him again?

Reliability is a professional requisite. For it ensures not only quality in the man himself but quality in the service he renders.

Ability and Reliability are two qualities that you must possess to win and retain patronage. People require that you have them. If you have the first only, you may get trade, but you cannot keep it. If, however, you are lacking in the first, you cannot possess the second quality. The man who has not Ability cannot do Reliable work. He is a failure.

Endurance is a success requisite. While it is not absolutely necessary always to feel well to do your work well, yet there is no doubt of the fact that the well man can do more work than the sick man. Therefore he stands a better chance for success even from a professional point of view. From the true point of view the *well man* is the only one who can achieve *real success*.

Action is the requisite of a great success. The reason that many professional men fail to achieve is not because they are not men of Ability, Reliability and Endurance. There are many who do not succeed just because they lack the great thing necessary for big achievements—the power to do—*action*.

They are like a splendidly built locomotive would be in a race that required top-notch speed if it had steam on sufficient only for thirty miles an hour. The equipment is there, but enough dynamic power is not. The moral is, *Take on more steam* if you want to win in the race for *success*.

I believe you will agree with me now when I say that a man of strong personality is the man who has developed his AREA. He is the man who has Ability, Reliability, Endurance and the power of Action.

Even yet he may not achieve success—at least, the success he should. Why?

Because while he gets action, he does not get the right kind of action.

There is many a professional man who fails to seize upon the most potent form of *indirect advertising* in his power. This is, *the education of his patrons regarding the quality of his service.*

Superior service deserves to be paid for, but you must teach your patron why, or the man who does poor work for a cheap price will likely convince him you are overcharging him.

“Why, Dr. Green would have filled my teeth for \$15, and you charged me \$50,” complains a patient. Now, you should never have such a complaint—in fact, never would have had such a complaint if you had understood the art not merely of filling your patron’s teeth but of rendering him the still more important service of giving him satisfaction.

You know your work is superior to Dr. Green’s. In fact, your very material cost more than he would charge for his work. Then you know your professional skill is greater; that you are too honest to turn out the quality of work that Green is willing to do. You know this; but your patron doesn’t. But he should have known, and then Green’s price, instead of attracting him, would have disgusted him.

Yes, show a man that you are benefiting him and you have found the way to both his heart and pocketbook. You have won his good word, too; which will be the source of future profit. This is the way to start an *indirect advertising campaign*. It is “business-building” of the high type that will not offend the ethics of the most dignified profession.

However, before you can educate your patrons up to the quality of your service, there is a very important branch of knowledge you must master. There is a great book you must learn to read—*Human Nature*. You must know how to handle the different types of men and women who are your patrons.

Some dentists insist on making gold fillings for persons with amalgam pocket books, and frighten the patients away. Others are satisfied to use amalgam fillings for persons who could afford gold fillings.

Character analysis is now one of the exact sciences. Experts have found laws by which you can judge the men and women you meet.

Successful merchants and professional men have mastered this science and are applying it daily. If you want to keep up with the race you must do the same.

As Kipling says, “Men of little minds’ get up to buy and sell,” but the time has come that the highest mission of all honorable business is the

rendering of *efficient service* to the Profit of the Seller and to the Benefit and Satisfaction of the Buyer.

If you would render such service, you must—

First, know yourself;

Second, know the other fellow;

Third, know your profession;

Fourth, know how to apply this knowledge.

All this you can know if you will.

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## TWO PRACTICAL POINTS.

By E. E. Haverstick, D.D.S., St. Louis, Mo.

In cooling the sprue in the wax for an inlay, the cold water should be thrown on the sprue first and then on the wax. This will prevent the soft wax from being washed away from the sprue. It is easier and more accurate, where possible, to remove the inlay by clasping the sprue between the thumb and finger instead of pliers, as in that way we can *feel* the easiest way to remove it.

Care should be taken in the use of lactic acid in treating pyorrhea alveolaris in order to prevent the acid from attacking the teeth. During the past six months I have seen a number of decays caused by its use, and I am sure that much care had been taken with it.

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## A CASE OF ACUTE COCAIN POISONING. NERVOUS SYMPTOMS PREDOMINATING.

By E. Ballard Lodge, D.D.S., Cleveland, Ohio

Owing to a recent experience of poisoning by cocain in which the writer was the victim, it seems to warrant citation because of the very general use of the drug as a local anesthetic.

I have been fortunate in securing a detailed statement of the case by the physician who administered the cocain, which account appears in connection with this report, and my statement regarding it will be for the purpose of giving the subjective side of the incident:

On June 8th last I mentioned to Dr. White in a casual way that I had a small growth between the shoulder blades which I had some thought of having removed. An appointment was made to have it attended to that afternoon. Nothing was said about an anesthetic, but the doctor employed hypodermic injections of cocain solution and deftly removed a sebaceous cyst the size of a hazelnut, placed one stitch and dressed the wound in the usual manner.

Within perhaps three minutes from the introduction of the cocain I felt a rush of blood to my head that seemed to come on with cyclonic force, and this was immediately succeeded by a feeling of nausea. This



I tried to resist, but was unable to overcome it, and had to part with my recent lunch. There was then a feeling that I must lie down flat upon my back and I chose the floor.

I also put my heels in a chair and became very much interested in my symptoms. All the typical symptoms of cocain poisoning manifested themselves. The pupils were dilated, pallor and perspiration appeared on the face and general numbness of the extremities was observed. I was not greatly alarmed, though there was of course some apprehension. Loquacity was a prominent symptom. I talked almost incessantly, and as the doctor had requested that I desist I tried even to the extent of tightly holding my lips in the grasp of the fingers, but could remember only a few seconds when the excessive talking was resumed. I recall that I was perfectly rational all the time, but that I frequently digressed and rambled on and on at great speed.

There was present the usual dryness of the mouth, especially the anterior third of the tongue, but the most notable symptoms from my point of view was the extreme tingling in the palms of the hands and the soles of the feet and the nervous symptoms manifested by a constant desire to kick over the chair and to support my weight on the back of the head and the heels, together with a slashing from side to side and a clenching of the jaw (clonic spasms).

For about three hours these things were going on. The doctor had made me very comfortable by bolstering up the hips with an extra height of leather cushions and rubbing my hands.

Extra wraps were laid over me and the effects of the drugs used to combat the symptoms were soon apparent.

The tingling in the hands and feet is only comparable to the vibrations felt when holding the electrodes of a strong faradic electric machine. This persisted for over two hours. In about three hours from entering the doctor's office it was deemed prudent to allow me to be taken home. I was well able to walk to the car, though I felt some unsteadiness for the rest of the day. That night was restless, but I was able to sleep some. On the day following I endured a severe headache, as well as occasional pains in the left arm and thigh.

It was about three days before I felt wholly recovered from the effects of the poisoning.

No blame whatever was attached to the physician in this case, as he felt sure that he was administering a dose not in excess of what is considered allowable in such procedures.

Idiosyncrasy is always, however, to be suspected, and there seems little doubt that in this case there was a special susceptibility.

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REPORT OF THE PHYSICIAN, WILLIAM H. WHITE, M.D., CLEVELAND, OHIO

Patient. Dr. L., age 40, dentist by profession, American born, resident of this city for the past fifteen years. Came to me on June 8th,

1911, for an operation for the removal of a sebaceous cyst over the second dorsal vertebra of the spine. The cyst was of the ordinary type of sebaceous cysts and was about the size of a hazelnut when removed.

After sterilizing the field for operation I injected hypodermically twenty minims of a two per cent. solution of cocaine hydrochloras. I immediately made an incision over the cyst and by careful dissection removed the cyst without rupture; the wound was then thoroughly sterilized and union was obtained by first intention. In some two or three minutes after the administration of the drug I noticed the patient becoming nervous with heightened reflexes, accelerated pulse and deepened inspirations, flickering before the eyes, vertigo, shooting pains through the arms, limbs and face; in about ten minutes he became nauseated and later vomited. At this time the pulse was beating about 100 per minute. Some twenty minutes after the administration of the drug he was placed in a reclining position, his feet were elevated to an angle of about forty-five degrees; he remained in this position for about two hours, during which time all his symptoms above mentioned became increased so that at the end of one hour from the time of the administration of the drug he had reached his maximum toxicity. At this time his symptoms were as follows: Pulse 120, respirations deepened, the inspiratory time probably increased to four times the length of the expiratory time; the reflexes greatly increased, clonic spasms of all the muscles of the limbs, arms and inferior maxillary; there was a marked accentuation of ideas; his conversation was almost continuous; of this he was well aware, but it seemed almost impossible for him to lie still or keep from talking; his hands were cold, skin was dry and the muscles of his hands and arms were stiff and tense, pupils were markedly dilated, mouth and tongue were dry, muscles of the lower jaw were in tonic contraction; sharp pains radiating through the entire body, his mind at all times was entirely rational. He knew everything that was transpiring, and took a very lively interest and appreciation of his symptoms and condition.

At the end of the first hour after the administration of the drug he was given one-thirtieth of a grain of strychnine sulphate, hypodermically, also two drams of brandy by the mouth. He was covered with a heavy winter overcoat; his feet were still elevated at about forty-five degrees; in five or ten minutes after the administration of the strychnine and brandy a decided flush was noticed over the face with some improvement in the respiratory efforts, moisture appearing in the palms of the hands. In about an hour he was given two drams of brandy and fifteen drops of the aromatic spirits of ammonia in water; this was repeated in one hour; about thirty minutes after the administration of this last dose, which was about two hours after toxic symptoms appeared, I noticed slight improvement in the heart action, breathing reflexes and mental excitability. On my suggestion he got up and was able to stand without any difficulty, but was very weak and dizzy. After some difficulty he suc-

ceeded in passing about four ounces of highly colored urine. After this he sat in a chair for about twenty minutes and was able then to be taken to the street car. He reached his home without any further difficulties and ate his supper without any particular discomfort. He became restless on retiring and informed me the next day that he did not sleep much during the night, and the next morning he had a severe headache; he was able to resume his professional duties about twenty-four hours after the toxic symptoms appeared, further than this he has had no difficulties.

On summing up the case I am of the opinion that this toxic condition as a result of the use of cocain was due largely to the condition of the patient's excretory organs. He has suffered for some time with constipation of the lower bowel and hyperacidity of the stomach. He undoubtedly has an inherent susceptibility to cocain hydrochloras.

I have used in my practice a great number of times much larger doses than was given him, without any toxic symptoms being present; in fact, I have been using the very same solution which I used on this patient in a number of previous cases without the slightest toxic results.

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## REPAIRING BROKEN FACING WITHOUT TAKING THE BRIDGE OUT OF THE MOUTH.

By J. E. Metcalf, D. D. S., Fergus Falls, Minn.

My method is to select a plate tooth the proper size, grind off the flange so it will be flat like a facing, and cut off the pins and use a little articulating paper on the side where the pins are cut off. Press this to place and it will mark the pins, that are in the bridge, on the tooth to be replaced. Now take a carborundum disk and cut in a slot wide and deep enough to take in the pins. Keep on fitting with the articulating and grind to place until the tooth fits to suit you and lies on the bridge backing correctly. Cement to place and you will have the best kind of a repair.

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## COMBINATION PLATE AND BRIDGE WORK FOR SPECIAL CASES.\*

By Chas. E. Peters, D.D.S., Pittsburg, Pa.

Combination plate and bridge-work for special cases, so-called because these were neither strictly plates or bridges, but combined the advantage of both, eliminating disadvantages.

Case 1.—Teeth missing between lower left cuspid and the third molar, lost by pyorrhea. Molar loose, but gum surrounding it fairly healthy. Fixed bridge not considered practical, and the possibilities of the molar not lasting over three to five years; the denture was supplied in the following manner:

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\*Clinic at Lake Erie Dental Society, 1911.



Clasps were accurately fitted to the molar and cuspid extending a spur over occlusal surface of the molar, also one to extend upwards to the lingual of the cuspid and a bar of platinoid extending from one to the other and soldered. The teeth were then set up and vulcanized as a plate. This has been giving good service for one year and has a tendency to hold the loose molar in place, owing to the ridge lap, which bears all the strain.

Case 2. Presented with loose fixed bridge, crown on upper left second bicuspid and second molar, supplying first bicuspid and first molar. Removal of bridge showed a very badly softened bicuspid which had to be cut to about one-sixteenth inch beneath the gum margin to reach healthy structure. Molar was in fair condition. As the patient was a big fellow with strong jaws and a close bite, and was disgusted with bridge work and would not wear a plate, I proceeded in the following manner:

A new gold cap was made for the molar and cemented to place. The bicuspid root was treated and a flat cap with platinum tube was made for it, after the "Peeso method." The second bicuspid on the opposite side being badly decayed, it was treated and crowned. A gold saddle was swaged for the left side ridge, then a fourteen-gauge splint pin soldered to this, which fitted into the tube, also a clasp fitted for the molar crown, then a gold bar eleven-gauge was extended across the roof of the mouth to the crowned bicuspid with a clasp fitted to it and soldered to the bar. The teeth were then set up, using Steele's facings, and soldered to it, making a sanitary piece which the patient has been wearing with great satisfaction for two years.

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## PAINLESS METHOD OF DEVITALIZING TEETH.\*

By Charles A. Priest, D. D. S., Marion, Indiana

One thing above all others, in the devitalization of teeth, is to prevent pain during the time of devitalization. And to do this you must keep in mind the fact that pain in this particular tooth is what caused the patient to first seek your aid. He feels that you can give him relief or he would not come to your office, and since he has placed such confidence in you, it is your duty to give him such relief without causing him to suffer greater pain during the process of devitalization. You must then treat that patient's tooth exactly the same as if it were your own tooth.

Do not cause undue pain while working upon it. Remove the cause of the pain, and the cause is some irritation. It may come from pressure upon the nerve, or it may come from some acid condition caused from the decay and the accumulation of food particles within the cavity of the tooth.

But the real cause of the pain is a blood pressure upon the nerve-endings within the tooth pulp.

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\*Clinic at Indiana State Dental Society, 1911.

Then to be painless in our devitalization we must not cause a pressure upon the nerve from without or cause an irritation of the nerve which would cause a blood pressure from within.

To keep from causing a blood pressure from within, you must remove all soft decay that can be removed without undue pain. Then cut a metal disk that will bridge across the nerve without pressing upon it. And after washing out the cavity well with warm water you place in the devitalizing medium, and bridge over it with the metal disk after which you can seal without causing pressure upon the pulp from without.

Then, if you do not want pressure upon the nerve from within, you must prevent an excess amount of blood from flowing into that tooth. That can be done by not causing another irritation of the nerve with your devitalizing medium.

You have removed the cause that produced the first irritation, and you have thus relieved pain. Then why place a treatment within the cavity that will produce as great an irritation as that which you have removed? Arsenic is used to devitalize the nerve, and arsenic will cause an irritation which will cause pain. Now what are we to do?

If you have pain after treating the tooth, in ninety-nine cases out of one hundred, you will have one of two conditions: You have either caused pressure on the nerve when sealing the cavity, or you have used an excess of arsenic, for it is only an excess of arsenic that will cause pain if you have not caused a pressure from without upon the nerve.

It would be much easier to show the amount of arsenic to use than to try to tell upon paper just the correct amount.

Personally, I use an arsenical paste that is only about 50 per cent. arsenic, and the amount I use is just about the size of a period used by this journal in punctuation, and this is placed upon a pellet of cotton about the size of a pin head, moistened with clove oil.

This treatment is then placed near the nerve in connection with a small piece of an "Adrenalin and cocain tablet, No. 151, of Parke, Davis & Co." The treatment is left in the tooth for six to ten days. Do not try to devitalize too quickly. Use less arsenic and longer time is the secret to painless devitalization. —————

## **A METHOD OF TIPPING A FACING IN BRIDGE WORK.\***

**Dr. W. T. Farrar, Louisville, Ky.**

After selecting facing that will be suitable, grind to position, place on model and take bite with modelling composition or metalline, carve to occlusion, remove and make metal die of same, stamp cusp, remove the facing from composition and when the model of the cusp that was carved out of the composition is placed in the cusp that has been swaged off of the metal die, you will have an accurate measurement by which you can cut the buccal aspect in such a manner that it will accurately fit the facing and show no line of solder.

\*Clinic at Indiana Dental Society, 1911.

**A METHOD OF GRINDING AND BACKING FACINGS.\***

By J. D. Whiteman, D.D.S., Mercer, Pa.

Facings are beveled from pins to cutting edge, thirty-four or thirty-six gauge; 24-K plate is burnished to fit, then removed from facing and 22-K plate or solder is flowed, or, rather, sweated on backing from pin holes to cutting edge until desired thickness of backing is secured. Backing is then replaced on facing and pins slightly bent down to secure them in position, when case is waxed up and completed in the usual way.

We also showed the effect of shrinkage of cast gold inlays in leaving an open joint at gingival margin, fatal to an inlay if set with cement. We showed where this joint may often be closed with gutta percha and then setting the inlay with cement. We also showed the absolute necessity of a rigid pin to secure any benefit in either strength or protection to joint from a band or spur in a cast gold base, in porcelain crown work, and stated that no metal, except platino-iridium, possesses the required strength or rigidity, particularly after being annealed, as it is during soldering or casting process.

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\*Clinic at Lake Erie State Dental Society, 1911.

**CAST INLAYS AS ABUTMENTS FOR SMALL BRIDGES.\***

W. L. Myer, Rensselaer, Indiana.

This clinic consisted of a bridge extending from upper right cuspid to first molar, replacing the two bicuspid.

The bridge was anchored to the cuspid by an inlay covering most of the lingual surface, inlay being cast to an iridio-platinum post in the root canal of the cuspid, and anchored in the molar with an inlay extending over all the mesial surface and most of the occlusal, depending on the retentive shape and pins for anchorage. The two bicuspid which were swung in were Steele's interchangeable posteriors. This made a very fine looking and substantial restoration.

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\*Clinic at Indiana Society, 1911.

**A CONTOUR GOLD FILLING WITH A VENEER OF SILICATE CEMENT.\***

By A. McAlpin, Warren, Pa.

A patient presented with mesial approximal corner broken from the left superior central incisor not involving the pulp. The cavity was prepared by trimming the margins and making a slight undercut at the inferior margin. An anchor screw was inserted at the cervical margin, the tooth was contoured with gold pellets inserted by hand pressure and auto-

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\*Clinic at Indiana State Dental Society, 1911.



matic mallet on the labial surface, except a small margin on the cutting edge and approximal side next the right central.

This cavity was filled with Schoenbeck's Silicate cement, thus covering all but a small line of the gold and hiding what would otherwise have been a very conspicuous unsightly display. By this method the stability of the gold foundation was obtained with the esthetic effect of the inconspicuous silicate cement.

## QUICK METHOD OF REPLACING FACING ON BRIDGE WORK WITHOUT REMOVAL FROM MOUTH.\*

By J. B. Pettibone, D.M.D., Toledo, Ohio

We use in this case a Steele's facing. When a bridge comes in with facing broken you will find in all probability a reinforced cusp. This you will grind with a flat edged stone until you get a flat surface for your facing. Dry your backing and place a little soft wax on the backing. Moisten the back of your facing and press that down in proper position on the backing. This will force the wax into the groove on the back of facing, and when the facing is removed the raised place on the wax is marked at the base and the distance upward that you want to make the width of your opening. Take a cross-cut fissure bur and drill your hole through your backing at the lower mark and work to the point or mark that is made above. With a right angle bud bur the opening is counter-sunk on the back. Then a piece of thirty-five gauge (Brown & Sharp) platinum strip is bent around a piece of twenty-one gauge wire. This gives you the proper size for fitting in the groove of the facing. With a pair of flat-nosed pliers you press the band tightly around the wire. With a little solder unite the wire and band and trim to fit the opening in the backing. This you place in the facing and pass through from the buccal surface to the palatal surface of the bridge. With your flat end burnisher press down into this saddle and burnish the edges into the counter sinking. Remove the facing and the stay from the palatal side. The V-shaped stay is filled with solder. Then a notch is cut into the stay to show the top surface, so in placing for cementing it will not be in wrong position. Cement in the usual manner. After cement has hardened the small spaces at each side of the stay on the palatal side may be filled with amalgam or gold.

\*Clinic at Ohio State Dental Society.

Life is too short to waste in critic peep or cynic bark,  
Quarrel or reprimand; 'twill soon be dark.  
Up! Mind thine own aim, and God speed the mark!

—Emerson.

## INFERIOR BRIDGE IN PYORRHEA CASES WITHOUT INLAYS OR CROWNS.\*

By E. C. White, D.D.S., Indianapolis, Ind.

In this particular case the left lateral incisor was missing. I devitalized the cuspid and central by pressure; ground the enamel to the angles of tooth on lingual surface. Placed my posts in roots parallel to each other, extending out of cavity about one millimeter. Warm inlay wax, press it over the posts and the lingual surface while warm and press the tooth, previously selected, into the wax and adjust to place. Chill the wax, trim as when finished and polish. Remove and invest after removing tooth and placing carbon points where pins of tooth were. Cast and cement tooth to place. I use this bridge where I use the lingual bar or the Gilmore bridge attachment.

\*Clinic at Indiana State Dental Society, 1911.

## THE CEMENT LINE IN INLAYS

By Clarence J. Grieves, D. D. S., Baltimore, Md.

(Continued from page 826, December Dental Summary)

### DISCUSSION

W. T. REEVES, Chicago, Ill.: I am thoroughly in accord with all of the subject matter as Dr. Grieves has presented it. I believe that you will find that when the paper appears in print and you have had a chance to study it and to go over it not only once but several times, you will get great benefit from it.

Now, I think that Dr. Grieves has summed up his conclusions that the filling that depends upon a cemented joint has proven far superior to the contact filling, or the gold or amalgam filling as it usually has been put in. As he said in that paper, the amalgam filling that has a cement lining is far superior to the filling that has no cement under it. His conclusion came to the point that the minimum joint, and the minimum amount of cement under the filling, gives the highest degree of result. He also spoke about inlay operators differing, as to those who have a fit of the cavity throughout and those who only have a fit of the cavity at the margin and depend upon a bulk of cement in the interior of the cavity. He divides the subject as between butt joints and lap joints, and shows how it is possible to obtain lap joints with a gold inlay. It is true it is only possible to obtain lap joints with a gold inlay in the way that he has outlined, through cavity preparation. It is also true that in all butt joint operations you are limited as to your ability to set that inlay to its place.

We will take the cavity preparation that you have been making for gold inlays—and I take it there are a greater percentage of the audience who use gold inlays than who use porcelain inlays. I believe that in all that I have seen and heard on the subject, that you are following in your cavity preparation a cavity form very similar to that advocated for gold foil fillings, that credited to Dr. Conzant, in which Dr. Grieves says is his ideal cavity preparation. I differ very decidedly from that cavity preparation. You have followed that cavity preparation through your teachings and training in the association of gold foil fillings in which you have had to have a retentive form of cavity and interlocking form of filling, and you are following out that belief that it is mechanics that also governs to a large extent the retention

of inlays in your cavity. I am still preaching that it is not mechanics in any sense whatever. You may have a mechanical form of cavity that will hold that filling in, before any medium is used to hold it in the cavity. It will not dislodge, but after the filling has been set mechanics does not enter into play until the cement joint is broken—the cement joint breaks all over the cavity in one instant. Consequently your mechanical fit will not enter into play. The greater area of surface you have, the greater degree of adaptation to that surface, and consequently the greater amount of retention, the greater pounds pressure resistance there will be to its dislodgment. I do not wish to carry the discussion away from the paper whatever, and I think the deductions of the paper bring us to the point that the minimum amount of crevice, or joint, gives us the greatest amount of security. That is, there can be less washout through mechanical force, if the cement does not wash out, and I believe it is a well established clinical fact that the cement in a well fitted inlay will not wash out but half the diameter of the crevice. Now, our object should be to obtain a fit of cavity throughout, as well as at the margin, as great as you have obtained in your cast gold inlays.

The next point is, have no butt joints at any portion of the cavity. You well know that we cannot take a flat surface of cavity and force the cement out to allow you to close that to the greatest degree possible. If your cavity preparation will take more of what might be termed a wedge shape you then may be able to set it with a minimum amount of cement. If I had a diagram (I wish I had known just what the illustrations had been, I would have made a diagram to illustrate what I want to give you as my form of a lap joint in a porcelain inlay, because I use that almost exclusively). I have a small model here that I use in teaching. It has been in use for a dozen of years, but I am afraid it is too small for you to see. If the filling enters on the wedge principle, in doing so you are able to force your inlay into the cavity and secure the minimum of joint. You will see that there is at no place anything of the nature of a butt joint.

I have seen a number of times in print and heard a number of times, and Dr. Grieves has spoken to you tonight in regard to porcelain inlay men speaking of the washout of the cement in their joint as advantageous to their filling, and that it helps in the making of the porcelain to match the tooth. I do not know as I can in any way illustrate just what I would like to show you. If there is a portion that would be a butt joint, and if filled with cement, the shadow would be cast directly into the inlay, but if you prepared that so there is no butt joint, you will see that your shadow is cast downwards and backwards, so that the shadow of the cement passes out through the inlay below the median line and it does not cast a shadow into your porcelain.

Another point is the conditions of the mouth that Dr. Grieves speaks of in connection with erosion, those conditions where porcelain looks well but are soon dislodged because of the loosening of the cement. That is very true, but in the same mouths gold foil fillings fail as quickly. I have found that in that class of cases, if I extend the cavity considerably beyond the area that has been affected by the erosion, then the acid that is precipitated will be dissipated by the saliva before it reaches the margin, and those cases that formerly were soon dislodged I have had no difficulty about their remaining in the cavity.

As I said at the start, I think the great value of Dr. Grieves' paper will come to you when you are able to read it. I hope it will convince you that the inlay principle of filling teeth really is the correct principle. In a great majority of cases it will preserve more teeth than any other method that we have used. The time is late and I thank you very much for your attention.

S. F. GILMORE, Indianapolis: The wisest man that ever lived said, "As iron sharpeneth iron, so doth the countenance of man his friend." And I want to leave it to you if your minds have not been sharpened by the countenance of Dr. Grieves,



and by his paper, what he has said and what he has illustrated. As I listened to his paper the quoted proverb came into my mind- "As iron sharpeneth iron so doth the countenance of man his friend."

I have longed for some light on this very subject that has been so well presented, and now I can say that I have the light that I sought. There is one question that forces itself upon the mind of every operator as he is giving the final and finishing touches to a filling of whatever character it may be, perhaps a beautiful gold inlay. It is a question that he asks himself, and the query is, "How long will this filling preserve this tooth; how long will it last?" and echo answers, "How long?". He says he thinks it will last for years, but as a matter of fact he doesn't know. The wish may be father to the thought.

I feel especially honored at being appointed as one to open the discussion of this paper. To discuss a paper from the pen of Dr. Grievess of Baltimore is a thing that I am utterly incapable of doing, but then, there is nothing to discuss; it is all to commend. The man who discusses usually feels called upon to differ with the essayist in some particular. In this case, to controvert is out of the question. It would be like essaying to differ with a man who said that two and two are four; there is no ground for argument. You know there are so many men who make deductions, that have their origin in fancy; they fancy that they will exploit that fancy and fancy that you will believe it. And while I concede the fact that Dr. Grievess' deductions do not have their origin in fancy, but rather are the result of careful, intelligent, painstaking, scientific research and observation, yet I must have a word with Dr. Grievess on one particular point: on the matter of giving preference to a cemented joint in what is termed the vulnerable chemical area, over one of perfect contact of metal to tooth.

Now, this perfect contact of metal to tooth may be had by a properly manipulated high grade amalgam, thoroughly burnished and perfectly adapted to the cervical wall of a cavity that is so situated as to be practically inaccessible to direct vision, or after a filling is inserted, inaccessible to even reflected vision. The class of cavities that I refer to are those deep ones on the disto proximal surfaces of molars, superior or inferior; those dark corners where you cannot see what you are doing, or what you have done after you have done it. The insertion of an inlay in such a locality is always accompanied by a feeling of doubt on the part of the operator as to whether or not he has secured good contact at the cervical wall, as to whether or not there is proper alignment between metal and tooth surface. If his exploring point conveys the information that the gold overhangs, he finds it impossible to burnish to any advantage through the embrasures. His patient will not submit to it; all efforts to do so result in irreparable damage to the soft and sensitive tissue. If he has accidentally produced an inlay entirely free from overhang, if he has a perfect alignment between metal and tooth, what assurance has he that the shrinkage of his casting has not resulted in too fat a joint to be dependable, especially in a butt joint?

As our essayist says, "A greater number of failures may be noted at this point, the vulnerable chemical area, than at any other, for the evident reason that the correct setting and finishing of the lap under the gingivus, without damage thereto, or overflange, causing retention, is one of the most difficult procedures in operative dentistry, and needs much betterment."

In my experience with inlays of the *matrix* type, I have discovered that the weak point is the cervical wall, principally in all cavities of the class referred to; that perfect adaptation and surface alignment is out of the question; and that without these important factors, recurrent caries at the gingival margin is the result in most cases. As the result of my experience along this line, I have adopted and practice what I have proven in my own experience, at least, to be a satisfactory solution of this problem: All cavities having a gingival wall or border that are not accessible

to reflected vision, or satisfactory instrumentation, after the filling is seated, should, as a part of their preparation for an inlay, have at least a layer of amalgam, one or more millimeters in thickness, vigorously and thoroughly burnished to contact with said wall. A careful adaptation of the matrix will make this method an easy matter, because the modern matrix properly adapted automatically produces contact and alignment. All that is necessary is for you to apply the force.

This method carries with it the sustaining argument that the element of guess work is largely eliminated, so far as adaptation is concerned. The field of operation is brought up to a point where the operator can see what he is doing. What a comfort it would be if we could see exactly what we are doing in a large number of the operations we perform in the human mouth. What a comfort it would be, if the element of guess work could be eliminated, when we are preparing for filling a canal that is filled with deleterious matter. If we could only see when we have the last bit of septic matter out of that canal, and when we have properly sterilized it for its filling; if we could see our gutta serena point carried just to the right spot. Speaking about comfort, I am tempted to tell a story:

An Irishman and a Dutchman were working side by side on a public highway, and as they worked they talked. Among the various things they talked about was the subject of what was the most delicious article of diet. The Irishman thought nothing could excel the Irish potato. The German said there was nothing that could equal Limburger cheese. The Irishman had never heard of Limburger cheese and it was new to him. The German said to him, "I will convince you; I will have my grocer send you up ten pounds of Limburger cheese and I want you to feel that you are putting your feet under a table that is groaning with the best thing it is the privilege of man to consume." When the Irishman went home that evening he saw Martha standing as he approached the house, with a cloud on her face, and she said to him, "Mike, you better not come in; well—maybe you better come in." Mike said, "Did a man bring something here?" and Martha answered "Yes; the grocer brought something up and it is spoiled, whatever it is, and the odor of it in the house is awful. I wish you would come in." Mike agreed with his wife that whatever was sent was a mistake and was *badly* spoiled. His Irish neighbor came in for an evening call and he sat there and talked about one thing and another. Finally his curiosity got the better of him and he said, "Mike, have you had a death in the family?" Mike was loath to acknowledge the cause of the trouble, so he thought the best way out of it was to say yes. His friend said, "Mike, was it one of the family?" and Mike said "Yes." "I hope it wasn't one of the children," and Mike said, "No, it was my mother-in-law." His friend said, "Well, Mike, it is an awful thing to lose a mother-in-law, but you have one thing to comfort you. When you come to bury her you will not be afraid she is in a trance—she is sure enough dead."

When a man puts in a gold inlay he satisfies himself in every way that it is a beautiful inlay, and his patient compliments him. In the course of time his patient comes back and takes his seat in the operating chair, and says: "You know that beautiful inlay you put in;" and you pass your instrument in there and it goes into a hole, and you find debris and one thing and another. You are satisfied at once that whatever was in there is not in a trance, anyway.

I submit that the experience of every operator present and the history of every amalgam filling that has been carefully and conscientiously planted against the cervical wall of a cavity, would, if such history were available, bear me out in the statement that a smaller percentage of recurring caries may be found in what our esteemed essayist has designated as "the vulnerable chemical area," where amalgam has been employed, than that of any other filling material. If you use this method you need not give yourself much concern as to whether or not the oral secretions remain normal or change to Hyperacid or Hypoacid conditions. One of the old dependable wheel horses of the dental profession can still, as in the past, be depended upon.

Now, will you tell me of any good and valid reason why you should not employ a thin film of quick-setting amalgam under an inlay in the territory referred to, and then comfort yourself with the thought that your beautiful inlay, with its perfect lap joints, lingually, buccally and occlusally, will stand as a monument to your skill and not eventually topple over because it was undermined?

ALEXANDER JAMESON, Indianapolis, Indiana: When I received a copy of this paper by Dr. Grieves I had the feeling that the gentleman who selected me to discuss the same did not show as fine perception or as good judgment as he should have shown. I think that it requires to discuss this paper somewhat of a mechanic, a good deal of an artist, a great deal of a bacteriologist, and a man who is more or less a past master in several of the arts that the average dentist has not time to look into. In other words, it presupposes more ability than I have.

However, there are some points that I particularly want information on. It is no discussion of a paper to get up and say that it is well read and well presented. We all know that, and this paper shows a wonderful amount of investigation and research. I want to cut my remarks short and get down to the gist of the matter and find out, for instance, where this fits.

There is a lesson to be learned in everything of this kind, from every effort that is an honest effort, and this one undoubtedly is, and we want to draw our conclusions where this fits into our everyday practice and life.

We are assured that the lap joint inlay is even better than we thought it was. However, I want to get back of a few things. I have never had much doubt of one thing, and I hope you won't hit me with a brick when I say it. I believe the average man doing the average work can do a better piece of work with an inlay than he can with a gold filling. That does not prove anything, however.

Dr. Grieves has shown by a great many figures and beautiful illustrations the cement line under these fillings. He has drawn a conclusion himself that the cemented filling is better than the contact filling. On the other hand, to go back and be scientific about it, he has not given us the history of those pictures. I doubt whether there are any of those cemented fillings that are as old as some of the contact fillings that Dr. Grieves has not had a chance to see. As a clinical proposition I have got to be shown that the right kind of a contact filling isn't about right. If it is not the right kind it may fall into the hands of Dr. Grieves and be dissected and thrown upon the screen. He hasn't told us how old they were, etc. I think they both ought to be put in under the same conditions, live the same life and then be subjected to the same analysis in order to give us something that is scientific. I do not believe the doctor said where these fillings were from, how long they had been in, who put them in, nor anything about the conditions. You can take a contact filling that has been doing nice work in one mouth for four or five years, and it will fail in another mouth. The doctor himself has given us a classification that shows that any filling fails in certain mouths and others do well. Now, those classifications, according to his own statement, might obtain in a case of this kind. A contact filling may have been in one of these mouths that was not the best place for it, or a filling of any kind. The cemented filling may have been in one where there was all the advantage. Until we can get data upon these things that are absolutely conclusive, I would not feel that his conclusions were absolutely to be relied upon. I think he is along the right track. His work has shown us some wonderful results.

I differ with the Doctor in one or two little things, but I do not know that it makes any difference. The doctor says that for gold inlays there is nothing but pure gold. I think that is a debatable proposition. The average gold filling is harder than the twenty- or twenty-two karat cast inlay. We have seen many contact fillings that have the characteristic floor, and you have a cemented filling that is softer than that is. The only possible advantage that I know of for gold filling would be that it would be



just a little harder than the twenty- or twenty-two karat gold. Time will tell and prove what is the best material.

Now, Dr. Grieves' ideas and theories presuppose another thing. These classifications were made. At the same time my idea is that those classifications more or less come up a good deal like the old question of temperament. We have to be an observer to tell anything about temperament unless we make quite a study of it. We say that so and so had black hair, etc., and a certain temperament predominates.

Now, to make these classifications effective there should be in every community of dentists some man or men with a laboratory where we could send our patients and have certain tests made. We know in a general way that so and so is so. We ought to be able to send our patients to the laboratory and have certain tests made to classify them. After all, it comes down to the proposition, if he belongs to this particular class where the lap joint fillings will preserve his teeth, why not make them all lap joint? Why not be hunting for the worst kind of a case and in doing that make every filling the very best we can?

In the discussion last night there were some amusing points brought out. Dr. Gilmore makes a statement that amalgam as a base was the only thing for a gold inlay. Dr. Grieves stated that he always puts an amalgam filling in with cement. Why not get all these things together and have them all right, have them all there? I think it would be a great idea to work all these things in and have a proposition that would be worth while.

The fact remains that I have seen as a clinical proposition contact fillings that are in the mouth, that have been there as many years as some of us are old, that are doing the work. Now, they may be in those mouths that are more or less immune, but some of them are not. After all, it comes down to that proposition. The well made contact filling—well, you have to show me that it isn't all right. Still I am delighted to know that the cemented inlay is going to have such a good send-off.

Now, the answer to all this is just one thing, and the Doctor suggested the answer in his paper last night, and it leads up to another trend of circumstances. Let us have cement do the work. If we go to work to get it we will get it. Let us get a cement that is acid and alkali proof and that will do the work. That brings up the story of the man who said he wished he had three hundred dollars. Someone said to him, "If you had three hundred dollars what would you do with it?" He said, "Well, if I had three hundred dollars I would buy a sawmill." His interrogator remarked that if he had \$300 he wouldn't need a sawmill. If we had a cement that would do the work why would we want a gold inlay? We have to do the best we can with what we have. This cement problem after all is the answer to the whole proposition, in my mind.

ALEXANDER WHITE, Indianapolis, Indiana: I would like to bring out one point that Dr. Grieves mentioned last night, about the use of pure gold for all inlays. I believe he made the statement that he used pure gold for all gold inlays, and I would like to ask if there are not some indications for using twenty-two karat gold. I am asking for information, as some of our best practitioners use twenty-two karat gold almost exclusively, while others claim they use nothing but pure gold. Which is right? I use pure gold almost exclusively, but use twenty-two karat gold in some cases, as for example the use of inlays for bridge abutments.

Another point made by Dr. Reeves' discussion was the model a great many of you saw. I would like to ask about the gingival of that cavity preparation. It is against the principles taught by Dr. Black and a great many others to make an upward slope of the gingival wall. They teach us to make a flat gingival base bevel the outer margin down, while he has the entire margin to slope upward. Knowing the anatomy of the tooth structure, I believe a cavity prepared in this way will leave short enamel rods to soon drop out, and we will have recurrence of decay at the gingival as shown by Dr. Grieves with the lantern slides.

Closing by C. J. GRIEVES, Baltimore, Md.: First I want to take up the point just made in Dr. Reeves' discussion of my paper. I would like very much to have that cast, and I want particularly to express my appreciation of what has been said in regard to that cavity preparation.

Dr. Reeves said that he made lap joints in porcelain. I think the general opinion is that the lap joint is where the cavo-surface enamel is lapped by the filling edge. That is not the result only of theory, that is the result of actual practice, as shown by Dr. Black and his confreres, and every operator knows that there must be no short rods left. The preparation made by Dr. Reeves was just the reverse of this rule. He cut under his enamel walls and left a lot of short rods which overlapped his butt joint. I noticed in the cast he presented that when it came to the incisal angle, his line was just the same as done by any other operator, his cavo-surface angle at 90 degrees, inasmuch as there was no cover then to the cavo-surface cement and it would be pumped out very quickly. Labially and lingually these short enamel rods would soon chip off; I doubt very much if they would stand.

I admire Dr. Reeves as an operator, but I have to say that much about that form of cavity preparation, inasmuch as it is just the reverse of what is practiced by every operator in all types of filling. That does not make it wrong, it may be right but I doubt it.

As to the other point, the mechanical retention, here again I will differ sharply with Dr. Reeves. He said that mechanical retention amounted to little or nothing, that the cement held the filling in the tooth. The cement is a retainer, of course, or we would not use it, but I have always thought that cement came into the joint to close that joint, simply as some adhesive media, to exclude mouth juices as between the filling and the cavo-surface enamel. If you are depending upon cement to hold your filling, why make any retention at all? The fact of the matter is that the mechanical retention I believe time will prove, after all, is the thing; the filling is retained by mechanical retention and that in turn retains the cement, and the filling must have some seat in the cavity that it may find its place.

There is a long line which we have not the time to go into. I think it has been shown by everybody who has studied cement that all cements leak. I showed some cement on the screen last night, stained one-third the depth of the walls. If they don't leak along the joints their body substance acts as a filter, filtering the saliva of the germs in the mouth and by this filtering process preventing decay of enamel. If you will experiment you will find the water-soluble will go down under the cavo wall in cement fillings. So I am not willing to depend entirely upon cement as a retainer. I want mechanical retention. I only wish we could figure out some way to make a safe lap joint in porcelain. If you lap your enamel the enamel chips off and so does the porcelain when it laps.

The next point, one brought out by Dr. Gilmore, is one upon which I would like to spend some time, that about amalgam. I shall feel repaid for my trip here if I have impressed you with one thing of value; I would like to leave with you the fact that the cemented-in filling of either crystal gold or amalgam is the greatest thing in dental practice today. I have been practicing this method for eight or ten years, the method of working quick-setting amalgam in slow-setting cement in large cavities in the back of the mouth, and with the oiled matrix working in and completing your contour in amalgam, you have a filling which is indeed "cemented in" with a line of cement much finer than could be made by the most expert inlay operator. If you watch those teeth for a year or two you will find there has been no discoloration of the surrounding tooth structure. All that I have said of the cemented-in amalgam I can more than accent for small fillings made of crystal golds in cement.

Personally I believe there is not an amalgam on the market today which does not materially move some time or flow under stress, so that I would not trust Dr. Gilmore's proposition of laying amalgam bare at the gingival seat, neither do I like the asso-

ciation with gold in the mouth fluids. I firmly believe that the reason amalgam fillings save teeth is from the fact that they leak saliva. One of the biggest gynecologists that I know of is placing a strip of silver foil after large operations directly in contact with the exudating tissue, the silver salts take care of the wound, which becomes black and finally disappears. So I figure that the old silver amalgam filling leaks saliva, and the salts of the saliva go down into the dentine and make the tooth black, and unless the crevice be a large one you do not have recurring decay. Nine-tenths of the average amalgam fillings I believe save teeth after that fashion.

Now, in regard to Dr. Jameson's remarks, I did not want him to say what he did about the mouth classification. I do not believe that it is at all as useless as the classification of temperament. I want to see every man get to be an expert in mouth diagnosis. I believe it can be done. That little effort of mine was the result of the work of other men simply being compiled, and I believe we will get to the state where we can look into the mouth and say what has happened to that mouth. You are doing it subconsciously every day. You are governed by what you are observing of the enamel surfaces and how the work of other men has stood. You glance around that mouth and make up your mind what you are going to do in this particular instance by what has occurred in the past. Every man cannot be an analyst, as the doctor says, of saliva, and I question how much it would help him if he could, but we can have some more definite idea, which I believe can be made practically this classification.

Just as an instance—I have been applying this method for about two years in my practice. I would not put a butt joint in an erosion mouth if I could help it, because I know that the acid salts would play "hob" with my cement. That is a very broad statement. That means your patients have to have lap joint or gold fillings in their teeth. We know that porcelain butt joints are going to fail in a little while, and I would trust a lap joint of all things under these conditions, because I think the gold can be worked down to such a shape as will stand. Again, you instinctively follow the rule of the hypoacid classification, where we have everything fail in examining children. The hypoacid period is the period largely of childhood. These little children use starches, have to have them. They use sugar, it is the carbo-hydrate food period. The saliva itself reflects their body condition, being loaded with glycogen. Under these conditions—I think you all know a hypoacid mouth—(and I believe some change can be made in the diet without doing damage to the patient). You would not put porcelain fillings in the mouth of such a child of the hypoacid mouth variety. I believe that these classifications have a practical value every day.

If you keep those three figures in your mind and look through the mouth you will find that you are applying that more or less and get more skilful in it as time goes along.

In regard to the contact operation, I approach this subject with considerable temerity. Before I studied the cement line I spent a good deal of time looking at every filling I could. My method was to slip a rubber dam over every filling and put formaldehyde on the surface to harden the films, then stain these teeth after extracting and split them open that I might get caval conditions as they actually were.

I made a statement in a former paper, of which some of you have copies, that personally I believed that there has never been a contact operation made but what leaked saliva at some point. In other words, that saliva flows through the joints and under all fillings. That your contact operation succeeds, regardless of the fact that it leaks saliva, we all know, because we have all taken out hundreds of gold fillings that have been leaking, and you have seen them in scores the best of contact operations. That these fillings did not fail is due undoubtedly, I believe, first to the mouth conditions. They may have been immune mouths. But principally I believe that the protective film I described has blocked those joints, as we know it does block the cement joint, preventing the ingress of bacteria, or isolating the culture from its habitat. This is what you find in a leaking contact operation which has leaked and yet is not carious.



I also maintain that the well made inlay joint does not leak except possibly a little, the cement acting as a filter, which was clearly shown by the staining in the cavalcement in my slides.

I tack my faith to pure gold, while I recognize the truth of what Dr. Gilmore has said. For the same reason that the contact operator uses his pure gold, I claim that I can make a better joint. What you are after is the cavo-surface contact between your gold lap and enamel, the lap can always be better burnished down. I think the proof of this is in the burnished inlay that we used to make of pure gold matrix and solders. I made very few joints which were as good by the old burnishing method as by the new gold; casting the gold solders or twenty two karat plate always made a ragged edge which I could not handle, and in the effort to polish it up I often opened up a very much larger lap joint than I had planned to have.

I want to thank all the gentlemen for their courtesy and to assure them that the field is just merely opened. I have only touched one little corner of it. I think it is a field primarily of mouth classification which we dentists simply must know. We must know our environment, we must know it just as much as the physician knows his environment. We can not get on by putting in three or four types of filling just because it is the thing to do, but we must study our mouth environment, and personally I know my results will be better. I hope this paper will be torn to pieces if it is wrong, because I want it to be right.

### OHIO STATE DENTAL SOCIETY MEETING.

THE forty-sixth annual meeting of the Ohio State Dental Society, held at the Southern Hotel, Columbus, Ohio, Dec. 5, 6 and 7, 1911, was one of the best attended and most profitable meetings ever held.

President Dr. A. O. Ross, of Columbus, gave for the annual address a carefully prepared paper on the subject, "Most Frequent Causes of Mortality Among Dentists Compared with Other Professions, with Means of Prevention." This paper with its statistical data and logical conclusions is a valuable contribution to the literature of the dental profession.

Dr. Fred W. Gethro, Chicago, Ill., read a valuable paper on, "Cavity Preparation for Foil Fillings and Inlays," illustrating by means of the stereopticon and blackboard. He paid special attention to the practical side of the subject and all who heard him were made better dentists for having been present when the subject was presented.

Dr. W. T. Jackman, Cleveland, read an elaborate report on Oral Hygiene.

Drs. H. T. Smith and Geo. T. Fette, Cincinnati, presented a paper on, "Penetration and Potency of Dental Medicaments." This contribution was founded on research work and adds to our knowledge along these lines.

Dr. Herman Prinz, St. Louis, Mo., gave a stereopticon lecture on "Modern Methods of Producing Local Anesthesia." It was a valuable presentation and covered the subject most thoroughly.

Dr. Geo. H. Wilson, Cleveland, gave a stereopticon lecture on: "Esthetics of Dental Prosthesis." It was intensely practical and showed the possibilities in artistic creations in this important branch of dentistry.

A symposium of three papers on practical subjects closed the literary program. Dr. J. K. Douglas, Sandusky, presented the subject, "Cast Gold Inlays vs Gold Fillings."

Dr. Henry Barnes, Cleveland, read a paper on, "Matrix or Sweated Gold Inlays vs Cast Gold Inlays."

Dr. L. E. Custer, Dayton, spoke on, "Porcelain Inlays vs Silicate Cement Fillings." A valuable series on these important subjects. All of the papers and discussions and descriptions of clinics will be published in early issues of THE DENTAL SUMMARY, the official organ of the society.

In the business meetings the following matters were given attention: An amendment to the constitution, presented by Dr. Callahan, providing for a Board of Directors, comprising one or more members from component societies, elected by these societies, was received and laid over for final action next year.

A motion to recognize the new Mouth Hygiene organization was unanimously carried. A fund of \$250 was set aside for the use of the State Educational and Oral Hygiene committee during the coming year.

Two hundred dollars was appropriated to bind volumes in the Ohio Dental Library. A Publicity Committee was authorized with duties to encourage and assist the press in giving the public anything that will be educational, and such reasonable publicity as is in keeping with the dignity of our profession. Also, to work in conjunction with a similar committee from the National Dental Association. A committee was appointed to amend the constitution and by-laws to conform to that of the National Dental Association.

Dr. Price, chairman of committee, presented a financial report of the local committee of arrangements for National Dental Association meeting last June. Of the \$500 donated by the Ohio State Dental Society for the entertainment fund, \$355 unused was refunded by the local committee on arrangements, N. A. D. A.

The following resolution, presented by Dr. H. C. Brown, was unanimously adopted: Whereas, The National Dental Association has tentatively adopted a constitution, following the plan of the American Medical Association, providing for State and Territorial Dental Societies becoming constituent members thereof and entitled to a proportionate representation in the House of Delegates, when two-thirds of the membership of any State or Territorial Society is officially reported to the National as members; therefore be it

Resolved, That the Ohio State Dental Society recognizes the need of a larger and more effective National organization and endorses the proposed plan as one which should have the support of all State and Territorial Societies; therefore be it further

Resolved That the Ohio State Dental Society in annual session, December 5, 6, 7, 1911, officially expresses a desire to become affiliated with the National Dental Association and pledges at least two-thirds of

its membership for a period of two years, beginning in 1913, in accordance with the aforesaid constitution.

The secretary's report showed that up to December 5, 1911, 678 members had paid dues.

The Ethics Committee was continued to report the revised code at the next annual session. Fifteen new members were elected. The Necrology Committee reported the following deaths during the past year: J. W. Lyder, Akron; T. C. Leiter, Wadsworth; T. G. Dennis, Jamestown; J. B. Lewis, Mt. Gilead; Grant Molyneaux, Cincinnati; P. S. Bollinger, Dayton; E. W. Stratemeyer, Chillicothe; L. L. Little, Greenfield; J. S. Van Meter, Galion, A. F. Bowman, Dayton, C. M. Wright, Cincinnati.

Officers for the ensuing year were elected as follows: President, Dr. C. R. Converse, Springfield; 1st Vice President, Dr. W. A. Price, Cleveland; 2nd Vice President, Dr. J. K. Douglas, Sandusky; Secretary, Dr. F. R. Chapman, Columbus; Treasurer, Dr. S. D. Ruggles, Portsmouth; Directors for three years, Drs. J. B. Stewart, J. R. Callahan, C. I. Keely and F. M. Casto.

The next annual meeting will be held in Cincinnati in December, 1912.

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### ORDER IS SET ASIDE

#### Inlay Case Against Dentist to Go to a Hearing.

Owing to failure of counsel for the defendant to serve formal notice of the calendaring of the cause, Chief Justice Clabaugh has set aside his order of dismissal in the suit of Dr. William M. Taggart, of Chicago, against Dr. George W. Boynton, a dentist, for an injunction to prevent the use of the Taggart system of inlay in the filling of teeth.

The case will now go to a hearing on its merits at the January term of court.

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### DOLLARS AND CENTS MEDICAL JOURNAL

Dentists who are interested in the business side of their profession, and all of us should be and must be to some extent, should send for a sample copy of Dr. Henry O. Harrower's new medical journal, "*Successful Medicine*," devoted exclusively to the business end of the medical profession, in which much may be found of equal interest to the dentist. The subscription price is only 25c per year. Each number ought to more than pay for an entire year.

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### MICHIGAN STATE DENTAL SOCIETY

The next annual meeting of the Michigan State Dental Society will be held in Detroit, April 11-12-13, 1912. An excellent program is in preparation.

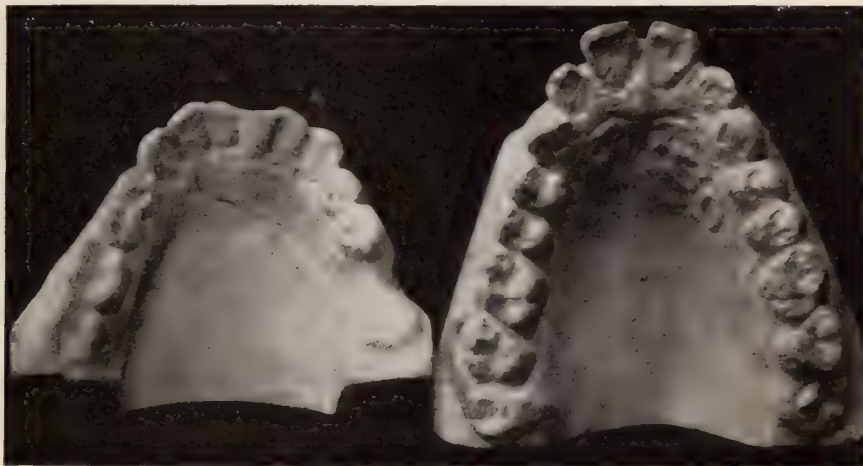


**AMERICAN CIRCULATING DENTAL CLINIC****INTERMAXILLARY RETENTION, ACTIVE AND PASSIVE.**

Martin Dewey, M. D., D. D. S., Kansas City, Mo.

ON the left side of the completed case, we have an example of active intermaxillary retention. On the right side, we have passive stationary retention.

The object of stationary retention is to provide some plan which will prevent the lower molar from tipping during retention; it being well known that the molars are prone to tip when the plain band and spur is used. By placing a D band on the upper molar and a plain clamp band



Cases before appliances were adjusted.

on the premolar we have the anchorage secured for our retention. These bands should be cemented to insure rigidity. A piece of the arch is then taken, the end bent back and reinforced with solder, which forms a plane for the spur of the lower to engage. The anterior end of the arch is then soldered to the premolar band. The lower is made the same way, in the case shown, except the anterior end of the arch is bent in the form of a hook to make a spur. The appliance should be carefully fitted and when being set with cement the arch should be in place and both bands set at once. The proper pressure can then be obtained to prevent the teeth from tipping.

In the case shown, owing to the loss of the first lower molar, the nut on the piece of the arch is anterior to the tube on the molar band. In cases where all of the teeth are present the nut is placed distal to the tube, which makes it necessary to unsolder the tube and reverse it.

This form of retention holds the teeth firmly, but owing to the fact that they are held so firmly, they do not assume their normal functions as readily as when allowed to receive the full stress of mastication. Therefore, I have discarded this form and am using active intermaxillary retention. With this form the teeth receive all of the stress of mastication and we have an active force which causes the tissues to assume a normal function more readily.

A band is placed on the lower molar with the screw pointing distally. This prevents any tendency of the rubber to pull the molar buccally. A spur is placed near the mesio-buccal angle. This spur should be placed as far mesially as possible, so the pull of the rubber ligature will have a tendency to straighten the molar. It will also have a tendency to elongate



Cases after appliances were adjusted

the lower molars in those cases where they are in infra-occlusion. The upper teeth are retained by placing bands on the canines with a wire, as shown on the cast. A spur is placed on the band near the disto-buccal corner to engage the rubber ligature from the lower molar. There will be no danger of elongating the upper canines, as they are in occlusion with the lower teeth. The spur shown on the right upper canine band is not used with stationary retention, only with active retention.

Expansion of the molars can be obtained by some form of the lingual arch, which has been described many times of late.

A reprint from *THE DENTAL SUMMARY*, "Some Principles of Retention," can be obtained by sending a request for the same to Martin Dewey, Kansas City, Mo.

## OBTURATOR MODEL

R. M. Seibel, D. D. S., Kansas City, Mo.



Fig. 1

Fig. 2

1.—Impression removed while still soft, using fingers for an impression tray.

2. Blank wax model, which is now used to get perfect working model, by adjusting and fitting in the mouth. Inserting a hinge at the



Fig. 3

point where soft and hard palate join. Heat wax quite soft and allow patient to swallow which will mark same, then trim and repeat until a perfect fit is obtained.



3. The obturator as finished. Making all thick parts hollow, as you will notice.

4 and 5. As finished wax model is invested with wooden toothpicks

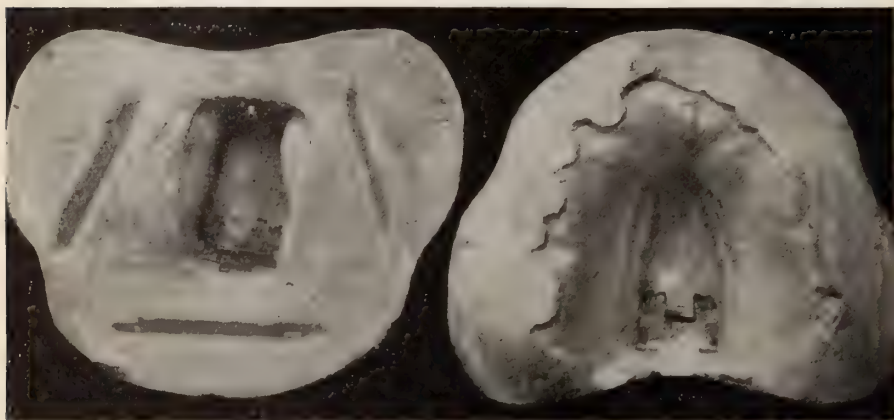


Fig. 4

Fig. 5

inserted in hinge to hold same in place in the plaster. The hinge should be of platinum and gold, *very heavy* (fully as heavy as the aluminum sample; likewise the pin). Clasps or attachments left to each case, using clasps, Morgan or Roach attachments, or any other preferred.

## AN INSTRUMENT FOR QUICKLY AND ACCURATELY OBTAINING THE SIZE AND SHAPE OF THE ROOTS OF TEETH PRIOR TO CROWNING

By Dr. G. E. Silverling, D. D. S., Chicago

Take about six inches of fine iron measuring wire which will pass double through the eye in end of plunger. No. 34 to No. 36 is correct size. Bend in hairpin shape and pass the two ends through eye and draw through until the loop is a little larger than the tooth to be measured. Withdraw plunger until head is about one-fourth to one-half inch from end of barrel.

Pass the two strands of wire through fork, wrap once and a half around and pass through fork again. This securely locks the wire and makes instrument ready for use.

Place loop over tooth to be measured, getting it under the gums and over the margins of any deep proximal or gingival cavities. Put enough traction upon the loop to make it draw up snug to the tooth and push on plunger until the head rests securely against the tooth.

To remove easily, and without distorting, withdraw the plunger a short distance, which will allow the loop to spread open and slip off easily.

This gives a loop of correct size and shape.

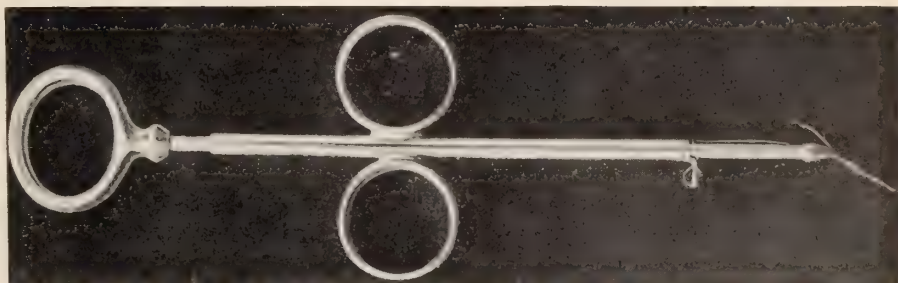
To use this measure clip the loop free from the instrument (allowing about one-fourth inch of wire). (a) Open the loop and clip off one end

at the angle. (b) Catch the other angle in square-nosed pliers and draw the loop through the fingers, straightening it out. (c)

The special advantages of this instrument are:

First—In measuring short roots, such as one which has carried a Logan crown, there being no twisting, the wire will not slip off, and the measure is easily obtained.

Second—Teeth with deep proximal or gingival cavities are easily measured for the same reason, as it is the twisting which throws the wire off.



Silverling's Odontometer

Third—A tooth can be measured before being ground down. This is desirable in some cases of seamless crown work.

Fourth—Such teeth as lower second or third molars, which lean forward at an angle that makes measuring by twisting very difficult, are very easily measured by holding the head of the instrument off to the side either buccally or lingually, letting the loop stand at right angles to the plunger if necessary. The head will draw up to the tooth just the same.

Measurements may be taken approaching the tooth from any angle.

One pair pliers, 1 pair scissors, 1 spool 36 wire, 2 models, 1 Silverling Odontometer.

## A SPECIAL INLAY INSTRUMENT.

By Dr. Vincent Lasbury, Chicago

AN AID TO MECHANICAL ACCURACY AND A TIME-SAVER IN PREPARING WAX MODELS FOR INLAYS.

This instrument is designed for attaching the sprue to wax models for inlays and simultaneously cooling and removing the wax. In its use there is no danger of distorting the wax model before it is placed in the sprue holder for investment.

From my own experience, I recommend the following method as most convenient and reliable:

Fill the cavity with wax, preparing it in the usual manner for an inlay. Place a sprue in the tip of the instrument, compress the sack and draw it full of water: heat the point of the sprue just enough to melt the wax about the groove in the point, insert it into the wax and, at the same time, compress the sack. A moment after the water is expressed, the wax cools and hardens, the sprue is firmly attached, and the model may be easily withdrawn from the cavity in perfect form. With a pair of pliers lift the sprue from the instrument and place it in the holder for investment.

If the filling be large, cool it with water from syringe before using instrument.



Wax Inlay Instrument

#### DIRECTIONS FOR REPLACING SACK

To replace the sack, unscrew the point from the barrel, pull out the point, slip end of new sack into place and tie it securely with a waxed floss silk. Tie the other end of sack close to tip, leaving about four inches of floss on the knot, and, with this floss end, pull the sack through the barrel. In screwing on tip, first turn tip three and one-half times to the left (or backward), then screw into place. Pull end of sack once or twice, and it will straighten out under the compression bar.

Whenever tip is unscrewed from barrel always replace as directed above.

Extra sacks may be secured from supply house from whom you procured instrument.

### CAMPBELL'S COW-BELL METHOD OF CASTING PLATES.

Dayton Dunbar Campbell, Kansas City, Mo.

In describing this simple and unique method of casting aluminum plates, we will not go into the question of the superiority of the cast metal denture over one made of vulcanite, but give in a homely way the procedure in detail:

#### INVESTMENT MATERIAL

After taking your impression, coat it with your favorite separating fluid and *when dry* rub well with soapstone and pour with an investment



compound after the formula originated by Dr. C. C. Allen, which consists of *equal parts* of *Portland cement* and *dental plaster*. This compound is in keeping with the simplicity of the casting machine, and in fact, is cheaper than plaster, sets very fast and is free from shrinkage and expansion, making an ideal compound in bridge work.

It is hardly necessary to say that the plaster and cement must be mixed dry beforehand, and so thoroughly that when patted down with a spatula no particles of plaster are distinctly recognized. To obtain the best results, this material must be worked thicker than plaster.

#### SEPARATION

On separating the impression from the model, if the former when poured is jarred down well, the model will present a finished surface. The part of the *model* the plate is to cover is now *rubbed* well with *soap-stone*. This gives the model a metallic luster and a surface very desirable to cast metal against.

#### WAX

The model is now covered with a new, clean piece of common yellow *base-plate wax* and care taken that it is of *even thickness* throughout, and that it has not buckled on the ridge in the median line. The wax is now *trimmed* as you wish the *plate to be*, and care taken to cut it low where the depressor muscles have action, usually in the region of the first bicuspid. The *outer edge* of the wax is now *stuck* to the *model* all the way around with a dry, sizzling-hot spatula, held at a right angle with the wax. A *strip* of wax 3-16 of an *inch wide* is now cut lengthwise from a sheet of wax and *laid down flat* on the wax model even with the edge, except near the heel of the plate, where it is brought over to the lingual surface. The wax strip is brought as near the top or bottom of the ridge on the palatal or lingual surface as the case will permit, the idea being to do away with as much rubber as is possible. The outer sixteenth of this strip is now made a part of the wax model by thrusting a dry, hot spatula through the strips all the way around *until the model is felt* beneath. The surface next the outer border of the strip is now filled in with wax and smoothed up with a chip blower and alcohol lamp, care being exercised to leave the inner edge of the strip square. At this point lower the temperature of the wax, which has become soft by working, by dipping model and all in water that is not cold; then, with a dull instrument, *raise the inner border* of the wax strip *all the way round*, as is shown on right side of Model No. 1. It should be lifted away most near the canine eminence and the lingual border of the heel. If this is done right, it affords all the attachment necessary. Sometimes it would be impracticable to use the strips on the labial border; it can be done away with altogether, and for the attachment of the rubber, loops of German *silver* or *aluminum* can be *set in place* on the wax and cast successfully. Of course, there is no union of the metals, but they are held in place mechanically tight enough to serve their purpose.

If you desire to cast directly on the teeth, the front is left open for the pink rubber, and a space of one-half to one millimeter left between all the teeth. This is imperative, because the contraction of the alloy or metal used in casting the teeth would all be checked or broken off.

The model is now trimmed even with the heel of the plate and a little roll of wax, about the size of a slate pencil and about three inches long, is stuck on the model with a hot spatula, even with and joined to the wax plate. Don't lay this piece of wax over on the wax, as it will not facilitate casting, but will be difficult to remove in the cast.

The last thing to do before you invest is to cut the model all over to get rid of the "slazy" surface it has taken on from handling, rubbing with soapstone, etc., so it will unite, so to speak, with the investment, and put it in a bowl of cold water. *The flask is a No. 5 Hoosier cowbell*, and will cost you seventy cents.

The strap at the top of the bell is placed in a heavy vise and removed. The rivet that holds the clapper is filed off some, and driven out with a punch. A one-eighth inch hole is bored a half-inch from the mouth of the bell at its extreme width on either side, to afford attachment for three feet of bailing wire, and you now have a plate-casting machine, as shown in the cut.

#### INVESTING

*To invest:* Begin mixing your home-made investment compound, and while it is thin, remove the model from the water and with a camel's hair brush fill in the grooves made by lifting the wax strip: then, working quickly, mix the investment thick and pour it in the cow-bell (it should be not quite *two-thirds* full), now put in the model; then, by holding the cow-bell between the thumb and three fingers of either hand, the index fingers are left free to push the model down: it should be jarred and pushed down until the model is about an inch below the surface, or, say until the fingers are in the investment to the first joint. Now remove the fingers, and by pressing on the wax pencil the model is kept in place while the jarring is continued until the surface of the investment is even.

The surface now presents a semi-liquid appearance which is immediately sprinkled with the dry investment to hasten the setting. In a very few minutes the top of the investment is scraped with a large vulcanite scraper (no attention is paid to the wax pencil, it being cut or twisted off and scraped down with the investment): until it is firm and solid. Then the investment, from an inch to an inch and one-half on all sides of the wax, is lowered about one-half inch and the whole top washed out to get rid of any small particles that might fall into the investment and cause a hole in the plate.

*The bell* is now placed on a *slow fire* and the *wax* burned out.

This idea of the disappearing model, of course, belongs to Dr. Taggart, and it is to him all credit should be given should this article prove beneficial to you.

The *burning of the wax* usually takes *an hour or more*. When the bell can be removed from the fire and there is absolutely no smoke issuing from it, you are ready to cast. The flask does not have to be very hot, and for this reason a very good cast can be made over a common plaster-paris model. If you are going to cast directly on the teeth, the method of investing and removing the wax is also a little different. The teeth are painted with whiting to prevent any excess of the metal adhering to the porcelain, a phenomenon that occurs that to me is very striking. An attempt to remove a film of the aluminum that may have run over one of the teeth without whiting means to remove just so much of the porcelain.

Place the flask on its side in a clean vessel and fill with *cold water* until it is covered *two or three inches*, *set on a slow fire* and bring to a boil until the *wax is all out*. Place on fire as before and heat slowly, but in this case, before you cast, the case must be heated pretty hot to bring the temperature of porcelain up to something near the temperature of the molten metal.

To cast, the cow-bell is laid on one side with the mouth elevated an inch or so. An ingot of pure aluminum, or Aerdentalloy, is then laid in the mouth of the bell and melted with a common gasoline blow-pipe. As the metal melts the bell is raised and it runs over the hole left by the wax. This is done for two reasons—first to keep out any small particles that might fall into the mould and to give you better access with the blow-pipe until the metal is thoroughly melted “and a little bit more,” then, without hurrying, but rather on the pokey order, lay aside the blow-pipe, take hold of the bale, already cold, and get where you will have plenty of room, swing the bell back and forth like a pendulum once or twice and then over your head, like you would a small bucket of water. The plate is cast, of course, the first round, but the swinging should be kept up half a minute, so that crystallization may take place under pressure. All casts made in this manner are better on account of their closer molecular construction.

The flask is now allowed to cool and the investment and plate shaken out; the excess cut off with a hack-saw and the plate finished.

The impression can be waxed up or the model scraped down at this point, but it is purely guess work and unscientific. *As a last resort*, when the plate is cast and *still* needs to be *raised* at this point a plaster model of the plate is poured, and when very hard, removed and scraped down as far as you want the plate. The plate is then placed back on the model and with a ball hammer beaten down to place.

**An optimist is a fellow who will sit up all night to make lemonade out of the lemons handed him through the day.—W. E. Mason.**



# CORRESPONDENCE

## "PROPHYLAXIS."

To the Editor of THE DENTAL SUMMARY:

The Wonderful Book says, "Is there anything whereof it may be said: See, this is new? it has been already of old times which was before." This thought came to my mind as I read Dr. Adair's paper on prophylaxis a couple days ago. I have a very modest dental library; still sufficient to provide facts to correct several statements regarding the term "prophylaxis," and to suggest that possibly the importance of the treatment has been recognized for a much longer time than the written and verbal assertions of some of its advocates might lead us to believe. First, the term prophylaxis:

Dr. Taylor is quite right when he says that its medical use is very old. J. Jones, in his *Nat. Beginning Grow*, published in 1574, says: "Things 45 prophylacticke that preuenteth disease." In 1605 Daniel Queen's *Acadia* says: "Yoo haue not very carefull beene T' obserue the prophylactick regiment of your owne body." Isaac Watts, in his *Logic*, published in 1725, says: "Medicine is distributed into prophylactick, or the art of preserving the health, and therapeutick, or the art of restoring health."

Dr. Rhein is wrong in his belief that he introduced the term prophylaxis into dental nomenclature. On page 259 of Harris' *Principles and Practice of Dental Surgery*, copyrighted in 1852, I find, "The importance of keeping the teeth clean cannot be too strongly impressed upon the mind of every individual. Proper attention to cleanliness of these organs contributes more to their health and preservation than is generally supposed. Against caries it is a most powerful PROPHYLACTIC.\*"

Dr. Smith got himself into very deep water in the paragraph in which he attacks Dr. Rhein's claim of original work regarding prophylaxis and attempts to settle the proper use of the term in dental nomenclature. Though Dr. Smith's statement, as it reads, leaves little room for doubt, it is only fair to him to suggest that possibly he has been misquoted, or that the full context of his letter might place a different construction on the sentence, "He never heard of it or thought of it until I published my first paper in 1898." If Dr. Smith will consult the index of the *Cosmos* for 1887 he will find, "Prophylaxis of the Teeth." In the index of the 1897 *Items of Interest* I find the following titles of papers: "Prophylaxis; Necessity for General Education in Dental," "Prophylactic

Treatment After Weaning," "Prophylaxis." I quote these two volumes merely to indicate that the word seems to have been used in dental literature prior to 1898 and the obvious conclusion is that Dr. Smith is wrong in the apparent assertion that Dr. Rhein was dependent upon his 1898 paper for the dental use of the terms. I was satisfied when I found these uses in the *Cosmos* and *Items* and did not pursue my investigation farther, so I do not know how common the words were prior to 1898.

Dr. Smith is particularly unfortunate in his attempt to settle the grammatical classes of prophylactic and prophylaxis. He defines prophylactic as a noun and then says that it is an adjective. Next he defines prophylaxis as both a noun and adjective and says that it is always a noun. He says, "Prophylactic is a remedy." Grammarians say that nouns are the "names of things of which we can think or speak." Then, if prophylactic is "a remedy," it must surely be a noun. The editors of the *Century*, *Standard*, *Webster's*, *Murray's* and *Encyclopedia* dictionaries agree with his definition that it is a noun and also with his assertion that it is an adjective. The doctor says that "prophylaxis is never used as an adjective but as a process or as descriptive of a process." I have not been able to find it used as an adjective and I think that Dr. Smith is right in saying that it never is, but he is very wrong in saying that it is "descriptive of a process." The grammarians say that adjectives modify nouns. Therefore, if prophylaxis "describes" a process it certainly modifies a noun and must be an adjective. But it is not. According to the authorities already mentioned prophylactic is both noun and adjective and prophylaxis is a noun only. Prophylactic was used as a noun by Harris in 1852. Dr. D. D. Smith himself, in the April, 1909, *SUMMARY*, uses prophylactic as a noun. He says, on page 273, "In the present state of almost universal unsanitary mouths it were well if, as a prophylactic, zhongiva," etc.

In view of the general use of the term "process," I think Dr. Smith is at fault in connecting it with prophylactic. The term process is used in the general dictionaries in association with chemical actions or mechanical operations; in Harris' *Dictionary of Dentistry*, as a bone eminence and as a chemical action. The only medical dictionary I consulted defines it similarly. Cleaning the teeth is a mechanical operation but to name it with a word that is generally associated with mechanics when we have a word so suggestive, so appropriate, so descriptive, and so generally used for the same purpose, seems entirely unnecessary and I question its advisability or propriety.

I suggest for Dr. Adair's perusal a paper by Dr. Geo. Mills, published in the *Cosmos* of 1879. For the sake of those who cannot conveniently see the article I quote a few passages: "I am frequently asked, 'Who does not clean teeth?' I answer, Who does? A few do, but a close observation proves very conclusively that there are but few in the profession who work with any degree of zeal in this direction."

" \* \* \* A very effective method for polishing about the neck and other surfaces of the teeth is to place a fissure bur in the engine, and winding about it a piece of cotton, make it into an elastic cone. Another valuable method is the use of the string and tape polish (which I described in a series of articles on the so-called Rigg's disease, published in the *Dental Cosmos*, 1877), to be used with moistened pumice, chalk and tooth powders." Please note the use of chalk and moistened tooth powders. That was thorough work. " \* \* \* Depend upon it that no service performed by us will call forth more real appreciation than this."

" \* \* \* A dentist deficient in all the other departments of practice but earnest as to the cleanliness of teeth, will be more successful in saving them than one more efficient in general practice and neglectful in this particular."

" \* \* \* If we will make this service occupy the first place in the clinic room, it will have a potentiality that will be productive of great good. Until this is done we make an almost useless expenditure of time and mental energy in trying to solve the problem of saving teeth. \* \* \* All uncleanly and unhealthy mouths favor disease of the soft as well as of the hard tissues, and the result in the non-resisting constitution is deterioration to a greater or lesser degree. \* \* \* The more attention I give to this subject the more I am confirmed in the belief that we have as yet but a faint conception of the deleterious effects upon the general health of a diseased oral cavity." And so he goes on discussing the effects upon the general health and the responsibility of the dentist.

The little I quoted from Harris and these quotations from Dr. Mill's paper speak for themselves. It must be patent that oral hygiene, sanitation, or prophylaxis is not the creation or invention in name or practice of either Dr. Rhein or Dr. Smith. Dr. Riggs claimed to be able to cure ninety per cent. of his pyorrheal patients; Dr. Mills does not state the percentage but indicates that it was high, and said that his success increased with practice. His methods suggest the thoroughness of his work. He followed pumice with chalk and tooth powder.

Prophylaxis is more generally practiced today than it ever has been and for that we must give a great share of the credit to the extremists, enthusiasts, or, in Dr. Adair's nomenclature, the prophylactic cranks of the profession.

Luther, Watt, Tyler and Patrick Henry were cranks. I doubt if there ever has been a sociological progress, whether it be political, religious, economic, or what-not, that was not initiated by a crank. So that while we sometimes disagree with their extreme views, object and occasionally retaliate to their dogmatic presentation, and see the folly of some of their conclusions, few of us but consider them a great benefit to the profession and profit by being inspired, enthused, and stimulated to more thorough and effective prophylactic treatment.

Phila., Dec. 11, 1911.

G. F. LOGAN.

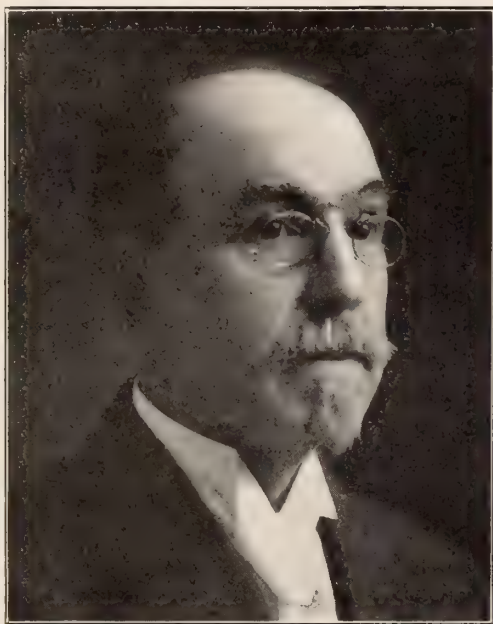
\*The capitals are mine.



# OBITUARY

## CYRUS MANSFIELD WRIGHT, M. A., D. D. S.

Cyrus Mansfield Wright was born in Cincinnati, Ohio, on February 18, 1842. He attended the Chickering Preparatory School and at the age of fifteen he became one of the assistant librarians of the Mercantile Library, where he read and studied with great avidity in all his leisure hours. Later he went to Oxford, Ohio, and was graduated in 1860 from



Miami University, and in 1894 received the degree of M.A. from that institution.

In 1862 he was sergeant of Co. A, Brigade O., V. M. Two years later in 1864, he was graduated from the Ohio College of Dental Surgery in Cincinnati.

Having entered the office of Dr. George M. Keely in Oxford, Ohio, first as a student and then as a partner he remained with him until 1865 when he went to Cincinnati to become the partner of Dr. J. G. Cameron, with whom he remained until 1871, with the exception of a year or more spent with Dr. McClellan in Louisville experimenting with Rose Pearl.

Early in 1872 Dr. Wright bought and took over the practice of

Dr. Van Marter in Basel, Switzerland. After fully establishing himself his active mind saw the necessity of closer associations among the American dentists in Europe. He suggested to Drs. Van Marter, Williams, C. D. Terry and Geo. W. Field the organization of a society for their mutual benefit and for the sake of the value such a society would be to the profession. These men cordially agreed to the proposition, and on a bright day in July, 1874, the little baby which has grown to such a vigorous manhood was born on the top of "The Rigi," and was christened "The American Dental Society of Europe."

From the first the membership of this society was limited strictly to men whose standing in the profession was of the highest rank, and at present, with the same regard for professional ability and integrity, it includes not only Americans from all parts of Europe but prominent dentists of other nationalities.

The little society developed slowly but steadily and when Dr. Wright was chosen its president at a meeting in Paris in 1877, he was greeted by a large and enthusiastic company of American dentists.

Preferring an American education and American environment for his children, Dr. Wright returned in January of 1882, to take up his work again in Cincinnati, Ohio, where he lived and practiced his profession until the day of his sudden death, which was caused by a cerebral hemorrhage, on November 15th, 1911.

Immediately upon his return to America he was elected to a Professorship in the Ohio College of Dental Surgery. The chair of Physiology and General Pathology he held continuously until he died, endearing himself to succeeding classes of young men and women.

During these almost thirty years he kept in close touch with the professional and literary life of his native city. He had held the office of president in both the "Mississippi Valley Dental Society" and the "Ohio State Dental Society," and was the author of several valuable works on dentistry, one of these being "Practical Hints about the Teeth," which was widely printed in German and English. Dr. Wright was a constant contributor to foreign and American dental journals and was always a welcome guest at society meetings, reading papers of interest and importance at the annual meetings of the Illinois, Indiana, Kentucky and Ohio State Societies.

At the time of his death his term as president of the Cincinnati Literary Club had just expired. He held an honorary membership in the "United Chapters of Phi Beta Kappa Alumni."

Dr. Wright was a man of strong and pleasing personality, vigorous and original and independent thought, kind and generous, courteous to all. No words could more truthfully express the character of Dr. Cyrus Mansfield Wright than those fine words of Robert Louis Stephenson in his "Guidance of Life"—"To be honest, to be kind, to earn a little and to

spend a little less; to make upon the whole a family happier for his presence; to renounce, when that shall be necessary, and not to be embittered; to keep a few friends, but these without capitulation; above all, on the same given condition, to keep friends with himself—here is a task for all that a man has, of fortitude and delicacy.”

E. W. T.

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#### DR. RICHARD JOHNSON PORRE

Dr. Richard Johnson Porre died at his home in Cincinnati.

Dr. Porre was born July 14th, 1824, near Jackson, Ohio. His early life was spent at Covington, Indiana. When sixteen years of age he began the study of medicine at Iowa City, at the same time assisting his stepfather, Dr. Jesse Bowen, in his practice. He also attended two courses of lectures at The Cleveland Medical College.

He began the study of dentistry in the office of Dr. Strickland at Cleveland, and at various times visited the office of Dr. S. P. Hullihen, a noted dentist of his time, at Wheeling, W. Va., where he received much valuable instruction. In 1854 Dr. Porre located at Richmond, Kentucky, where he married Miss Lucy Busby in 1857. Here he remained until 1864, when he removed to Lexington, Kentucky, practicing at this location and becoming widely known and much sought after until 1868.

At this time, seeking a wider field, he located in St. Louis, where he at once became a leader in his chosen profession. He joined the Missouri State Dental Association at the fourth annual meeting, June 2nd, 1868, and served as its treasurer in 1869. He was elected president of this association in 1870, but declined the honor. He served as secretary for two years of the St. Louis Dental Society, and in 1871 was its president. About this time he was elected an honorary member of the Illinois State Dental Society.

In 1879, his first wife having died, he married Mrs. Lutie D. Moore of Lexington, Kentucky, and a year after removed to Cincinnati, where he at once became active in the professional life of this city and joined the Cincinnati Odontological Society.

He read many papers before this and other societies and was the first investigator to prominently call to the attention of the dental and medical professions the close connection between oral and general pathological conditions of the body. In a paper entitled “Pyemia of Many Years’ Standing, from Concealed Abscess Caused by a Wisdom Tooth,” read before the Cincinnati Dental Society and published in the *Cincinnati Lancet and Clinic*, November, 1882, Dr. Porre called attention to the possibility of infections in the oral cavity producing grave constitutional illnesses in other portions of the body. Later, before the Section on Dental and Oral Surgery of the Ninth International Medical Congress, he presented an extensive brochure entitled “Chronic Pyemia of Dental Origin,” showing the positive results of his original investigation along this line. This was published in the proceedings of that meeting and



extensively copied and commented upon in foreign and home publications.

To the credit of American dentistry it antedated Dr. William Hunter's claims for any originality in this field by over twenty years.

Dr. Porre practiced his profession continuously for fifty-five years, and his retirement from active work, after he was physically incapacitated, was a distinct loss. He was a gentleman of the old school, polished, keen of mind, brilliant, courageous, kind, courteous. He died as he wished to die, having no fear of the hereafter, or of the path that leads to it. The following words were attributed to him a few weeks before he died: "I have little patience with any creed that I have studied, but have unlimited confidence in Almighty God. The power that made the flowers in your garden, that brought them from seed to bloom, that created the sunsets that delight my old eyes, that left me a youthful heart in an aged body, seems to me fully capable of caring for an old doctor who has outlived his generation and who has found friends and kindness his whole life through."

—McG.

### MEN WHO WILL BE MISSED

After this issue of THE DENTAL SUMMARY had gone to press news reached us of the death of Mr. John Hood, of The John Hood Company, Boston, a man well known in the dental trade throughout the world.

Announcement also has been received of the death of Mr. William F. Brand, of Harmeyer & Brand, Cincinnati, on December 13.

We are advised by telegraph that Dr. S. G. Perry, one of the most prominent dentists of New York city, died at his home on Friday, Dec. 22.

Full particulars of the passing away of these well-known men will appear in the February number.

**A**bundant Health and a sufficient measure of Contentment: these first of all; then increased Usefulness, Success and Prosperity in your chosen profession; these and all that comes with them is our whole-souled wish for you for the New Year, coupled with the assurance of our willingness to do all that in us lies toward making our wish come true.

The Ransom & Randolph Co.  
Toledo Cleveland Grand Rapids

Dulcitude, 1911-12

# SOCIETY ANNOUNCEMENTS

## COMPLIMENTARY DINNER TO DR. WILLIAM WALLACE WALKER.

A complimentary dinner will be tendered to Dr. William Wallace Walker on the evening of Saturday, January 20, 1912, at the Hotel Astor, New York City. The dinner is given by the First District Dental Society of New York.

Dr. Walker has devoted himself for many years to the advancement of the interests of this society, and, in addition to inaugurating a very successful series of Post Graduate Study Sections, has also harmonized the conflicting society interests of the metropolis, by merging all of the existing societies into the First District Dental Society, which therefore now includes the New York Odontological Society, the New York Institute of Stomatology and the New York Institute of Dental Technique.

The committee makes this public announcement because they fear that some of the many hundreds of friends of Dr. Walker throughout the country may accidentally fail to receive an invitation. All who desire to be present are therefore requested to waive formality and send their acceptances at once to the treasurer, Dr. James W. Taylor, 106 East 57th St., New York, enclosing the subscription price, ten dollars.

SAFFORD G. PERRY, Chairman,  
HENRY W. GILLETT, Secretary.

## G. V. BLACK DENTAL CLUB.

It is with regret that the G. V. Black Dental Club of St. Paul, Minn., announces that it will be unable to hold its annual clinic in February, 1912. Illness of some of the members and of others whom we expected to help us make it necessary for us to take this action.

R. B. Wilson, Secy.  
206-8 Lowry Bldg., St. Paul, Minn.

## PIEDMONT DISTRICT DENTAL SOCIETY.

The next regular tri-annual meeting of the "Piedmont District Dental Society" will be held in Piedmont, S. C., March 26th, 1912. All of the time will be devoted to clinics with the exception of a short business meeting at which any one who wishes may ask the society such questions as, "How do you treat abscessed deciduous teeth?" or "How would you treat a tooth with a Richmond crown cemented to position with an abscess under it?" etc.

Clinics will begin promptly at 9:00 A. M.  
Piedmont, S. C.

W. Busey Simmons, Secy. and Treas.

# NEWS and OPINIONS

## ANNUAL MEETING OF THE INSTITUTE OF DENTAL PEDAGOGICS.

**Held Jointly with the Annual Clinic of The Chicago Dental Society.**

The week beginning Monday, January 22, promises to be an event in the history of dentistry in the middle west. On that day opens the joint meeting of the Institute of Dental Pedagogics and the Annual Clinic of the Chicago Dental Society, which will continue for five days. The joint program, preliminary announcement of which has been made, is certainly attractive enough to bring out a large attendance. The following extracts show that this joint meeting will be of more than usual interest:

### *Chicago Dental Society*

MONDAY, JANUARY 22, 1912

Manufacturer's exhibit (all day).

Monday evening, 8 o'clock. A stereopticon lecture on Pathological Conditions Found in Human and Animal Crania. Also illustrating the Author's Work in Hunting and Trapping. Dr. William Bebb, Los Angeles, Cal.

TUESDAY, JANUARY 23,

Clinic (all day) College of Dentistry, University of Illinois.

Manufacturer's exhibit (all day).

Tuesday evening, 8 o'clock—Report of Recent Studies of Deposits of Calculus and their Prevention. Dr. G. V. Black, Chicago.

### *Institute of Dental Pedagogics*

WEDNESDAY, JANUARY 24, 9 o'clock

Address of welcome. Mayor of Chicago.

President's address. Dr. Donald M. Gallie, Chicago.

Report of Master of Exhibits.

Report of Commission on Text Books.

Wednesday afternoon, 2 o'clock: "The Teaching of Comparative Odontology." Dr. William Bebb, Los Angeles, Cal.

Discussion of exhibits by representatives of the various schools.

Wednesday evening, 8 o'clock—Banquet.

Address—Prominent speaker of national reputation.

Visit Northwestern University Dental School.

Luncheon, 11:30 to 12:30.

Automobiles to West Side.

Visit Chicago College of Dental Surgery, 1 to 3 o'clock.

Visit College of Dentistry, University of Illinois, 3 to 5 o'clock.

Thursday evening, 8 o'clock—"The Teaching of Clinical Dental Pathology." Dr. H. T. Smith, Cincinnati, O.

Discussion of Teaching Facilities and Methods, with especial reference to the visit of the day to the Chicago Schools.

Prosthetic Dentistry. Dr. Ellison Hillyer, New York.

Operative Dentistry. Dr. H. M. Semans, Columbus, O.

Operative Technics. Dr. D. M. Cattell, Memphis, Tenn.

Oral Surgery. Dr. V. M. Blair, St. Louis, Mo.

Histology.

FRIDAY, JANUARY 26, 9 o'clock

"The Teaching of Dental Histology."

Dr. F. B. Noyes, Chicago.

1:30 o'clock.

"The Teaching of Applied Physics and Chemistry." Dr. Marcus L. Ward, Ann Arbor, Mich.

Report of Commission on Nomenclature.

Report of Dental Index Bureau.

Exhibits by the various Colleges during the meeting.

One of the most interesting features of this joint meeting will be the stereopticon lecture before the Chicago Dental Society, the paper before the Institute and the special exhibit of skulls and skins of animals by Dr. William Bebb, secretary of the dental department of the University of Southern California, Los Angeles. Dr. Bebb has devoted much time for many years to the hunting and trapping of animals, to the study of their habits and haunts and to the preparation of their skulls and skins. Dr. Bebb will be the honored guest of the Chicago Dental Society on this occasion and arrangements have been made for him to bring practically his entire collection for exhibition at both meetings. This collection is unique, not only by being the largest private collection in existence, but also through the fact that all of the animals have been ob-



# THE DENTAL SUMMARY

The Magazine That Helps

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No. 2

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The Michigan State Dental Society  
The Indiana State Dental Society  
The Kentucky State Dental Society  
The Louisiana State Dental Society  
The West Virginia State Dental Society

The Northern Ohio Dental Society  
The Northern Indiana Dental Association  
The Eastern Indiana Dental Society  
The Southwestern Michigan Dental Society  
Odontological Society of Western Pennsylvania  
The Lake Erie Dental Society

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Editorial Office; 1255 Neil Avenue, Columbus, Ohio  
L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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## STERILIZATION IN DENTAL PRACTICE.

By L. E. Custer, B. S., D. D. S., Dayton, Ohio

THE PUBLIC is today fast awakening to the fact that contagion lurks everywhere. There are on every hand disease-producing germs which are only waiting for a suitable field for development. Langfield says: "The germ of pneumonia is a constant inhabitant of almost every one's mouth, leading there a harmless parasitic existence; yet let the vital powers be reduced through fatigue, exposure or cold and it becomes an infectious agent." The wave of hygiene which is passing over our country and which is reaching all departments of activity will be productive of more good than any measure proposed in years.

I am not calling your attention to sterilization because the public demands it, but because I believe we have not been as careful in this respect in the past as we should have been.

A Chicago physician once said to me, "You dentists do not sterilize." He meant by this that we were not paying as close attention to it as does the physician and surgeon. We have been sterilizing, else how could we prepare and fill an infected pulp canal? But there are other fields demanding sterilization in dental practice; the operator's body and hands, the instruments which he uses and the field of operation. As cited in the beginning, there are infectious agents on every hand which are only waiting for favorable conditions for growth. There are a great many ways in which the dentist can open the tissues to infection, and I do not doubt that were it not for the natural slightly germicidal property of the saliva that infection would follow many dental operations. The naturally quick-healing property of the oral tissues, combined with the washings of the saliva, have prevented many an infection. The dog licks its wounds as if by instinct to prevent infection.

There is scarcely an operation made by the dentist but opens oral tissues. If it is not thus there may already be openings in the form of abrasions or the cracked corner of the mouth so often seen. The rubber dam may be applied, but even the act of applying, the pushing of a ligature under the gum or the application of a clamp may bring blood. The injection of an anesthetic, an extraction and the dressing of a tooth for a crown are especially dangerous operations.

The dentist by the very nature of his calling occupies a position which, if only for the sense of cleanliness, can well afford to pay closer attention to sterilization. Everybody thinks their mouth is the cleanest part of them and nothing shall enter it but the cleanest of fingers and instruments. But as a matter of fact, the mouth is a hot-bed of micro-organisms, and no cavity of the body presents such favorable conditions for their growth and development. Therefore, the dentist should for two reasons observe the closest details of sterilization. In one of the most recent surgical operations so much care is given to sterilization that the hands of the operator, no matter how clean and sterile they may be, do not touch the field of operation—all work is done with instruments which have been absolutely sterilized.

The first step should be the preparation of one's hands. It is not allowable for the operator to go from one patient to another without thoroughly washing his hands, and it is not sufficient to simply wash with water. Soap should be generously used. For my own use I have arranged a faucet of flowing warm water, which is operated by stepping on a little button protruding through the floor. Three things are gained by this—the hands are washed and rinsed by flowing water, which is preferable to a bowl of water; they do not touch a faucet handle, and they are warmed. A dentist should not touch a patient's face with cold hands. The tincture of green soap serves not only as a soap but, for reasons shown later, is one of the best sterilizing agents for the hands.

During the operations we often do many things thoughtlessly which should not be done without again washing the hands. Perhaps the worst practice is the handling of money during an operation without washing, and even the opening of a door with the hand could be criticized. You might a few moments before have opened the door with hands stained with blood or pus. Watch the surgeon at the hospital and see how careful he is to touch nothing but sterilized objects.

The sterilization of the field of operation — the mouth — cannot be as thoroughly done as other parts of the body, but that does not excuse us from making the attempt. All operations upon the soft tissues should be preceded by thorough washing of the mouth with a germicide. The best for this will be touched upon later.

The sterilization of instruments is of prime importance, particularly all cutting instruments. The burs, by reason of the fine leaves and difficulty of cleansing, are especially dangerous. Thorough washing with flowing water should be the first step, and the next is the actual sterilization. The best agents today are surprisingly simple. Moist heat of boiling water or, still better, a steam boiler capable of twenty pounds' pressure is the surest of all agents. We should bear in mind that many of the most dangerous germs are encapsuled and nothing but heat will penetrate the envelope. The medicinal agents used for this purpose have been entirely revolutionized of late. My attention was called to this by a physician of this city and later on it appeared in *THE DENTAL SUMMARY*. Doctors Post and Nicoll of Rush Medical College made an exhaustive course of experiments with the common germicides, with the most surprising results. It was found that the germicides upon which we pinned our faith were less effective than other agents which were supposed to be less potent. For instance, bichloride of mercury, which has been the king of germicides for about thirty years, was found, even in the strongest solution allowable to use, to be less effective than common alcohol. It has been found that to be effective as a germicide it should corrode any steel instrument. If a weak solution, the instrument had to be immersed in it so long to be completely sterilized that it would be attacked by the agent.

Not only was the bichloride found to be surprisingly ineffective, but other agents which had stood high were found to be equally so. Incidentally, however, the surgeon has been washing his hands with the tincture of green soap, and we as dentists have been using Listerine in the mouth, little thinking that the alcohol contained in them was responsible for the success that was given to some other supposed-to-be sterilizer. It now appears that the agent which was the real sterilizing ingredient in the soap and in Listerine was the alcohol. I understand that the proprietary preparation known as Listerine is largely alcohol flavored with some of the essential oils. We have been drying out cavities and pulp canals with alcohol for its dehydrating qualities, little thinking that it possessed a strong germicidal property. It is to be regretted that in these tests the



essential oils were not also tried out. We have been taught that the oil of Cassia, the most powerful oil sterilizer, is equal to the bichloride of mercury as a sterilizing agent.

These tests showed, in summing up, that the silver and iodine preparations were exceedingly high in germicidal property, but the most surprising of all was the high germicidal property of alcohol. Indeed, it ranks first as a sterilizing agent. All germs are killed in less than a minute in even a 50% solution. How fortunate it is for the dentist that this is so, for it possesses properties which make it especially desirable. Besides its sterilizing property, it is a dehydrating agent and does not injure the most delicate instruments. The mouth mirror may be immersed in it for days without being affected. The only objection, and this is trifling, is the dull brownish cast it gives to rubber-handled instruments when left in it for an excessive length of time. Drying of the instruments with a napkin is made quite unnecessary by reason of its high volatile property.

To make this practical, the hands should be washed with green soap, which contains a large percentage of alcohol, and more alcohol can be added if necessary. We today have very convenient appliances for dispensing liquid soap, which nicely serves this purpose.

The patient may in a measure sterilize the mouth with a 25 per cent alcohol. If objection is made to alcohol use Listerine or any of the proprietary mouth washes which are known to contain a good percentage of alcohol.

For the sterilization of the instruments a developing tray such as is used by photographers, which has been ground true on its edges and covered with a piece of plate glass to prevent evaporation, serves very nicely. For all operations in the mouth pure grain alcohol should be used. This is rather too expensive to use in the sterilization of the instruments, but what is known as denatured alcohol, costing sixty cents per gallon, serves just as well. Denatured alcohol is about 90 per cent alcohol, the other 10 per cent is naphtha, or gasoline, which prevents its use for drinking purposes, but does not in any way injure it for use in the arts. In a late German article it is highly recommended for instrument sterilization.

In conclusion, let us pay a closer attention to sterilization, which is quite necessary in this day, thereby increasing the respect of our patients and refuting the charge of the Chicago physician, for in so doing we are preventing infection. A clean office, clean body and hands and sterile instruments are demanded today, and we honor ourselves and the profession by practicing sterilization in all its details.

O, Lord, give us courage this day to ask for a profit on our work.—“Ben Franklin Messenger.”

## MODERN METHODS OF PRODUCING LOCAL ANESTHESIA.\*

By Herman Prinz, M. D., D. D. S., St. Louis, Mo.

**H**ISTORY: The elimination of pain during surgical operations is inseparably interwoven with the history of the human race. It has always been the aim of those interested in the cure of bodily ills to relieve pain in some empirical manner. The efforts to solve the riddle of painless operations were, however, seemingly so very futile that even as late as 1832 Velpeau was led to express his pessimism as follows: "To escape pain in surgical operations is a chimera, which we are not permitted to look for in our time." Little did he expect that he stood at the very threshold of the discovery of anesthesia and that less than a decade later the "nirvana" of painless operations would be an accomplished fact. And when Dieffenbach, in 1847, wrote these classical words regarding the use of ether as an anesthetic, "the beautiful dream, to eliminate pain, has become a fact — pain, the highest consciousness of our earthly existence, its clearest conception of the imperfections of our body, it has to bow low before the powers of the human mind," the world at large awakened to the fact that pain had been conquered.

The discovery of anesthesia is essentially to be credited to the dental and medical profession of the United States, and the names of Crawford W. Long, Horace Wells, William P. G. Morton and Charles F. Jackson are inseparably connected with it. "If America has contributed nothing more to the stock of human happiness than anesthetics, the world would owe her an everlasting debt of gratitude," said the late Samuel D. Gross, the eminent surgeon, who had ample opportunity to observe in his own operating room the most remarkable changes that followed the introduction of anesthetics.

From an historical viewpoint, comparatively few important methods for the purpose of locally obtunding pain are to be recorded prior to the introduction of cocain. The compression of nerve trunks for the abolition of pain seems to be of an old and unknown origin, which was revived by Guy du Chauliac and Ambroise Paré, and finally found a permanent place in surgery as the Esmarch elastic bandage. Physically reducing the temperature of a part of the body by the application of cold was instituted much later. Bartholin and Severino introduced this method in the middle of the sixteenth century. It became a lost art, however, until John Hunter, of London, again called attention to its benefits by demonstrating it upon animals, and Larray, the chief surgeon of Napoleon's army, employed it for amputating purposes (1807). James Arnott, in 1849, utilized a freezing mixture, consisting of ice and salt, as a means of producing local

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\*Read before the Ohio State Dental Society, 1911.

anesthesia. Through the efforts of Sir B. W. Richardson, in 1866, it was placed on a rational basis by the introduction of the ether spray. The various narcotics which were employed for internal purposes were also made use of as local applications. Mandragora, henbane, aconite, the juice of the poppy head, and many other analgesic drugs enjoyed a world-wide reputation. There is probably no other medicinal plant around which clusters more mysterious and quaint associations than mandragora. It should be remembered, however, that mandrake, or mandragora (*atropa mandragora*), must not be confounded with American mandrake, or May apple (*podophyllum peltatum*), to which it bears no relation.

The empirical search for new methods and means pressed the mysticism of the electric current into service, opening a prolific field to the charlatan, which even to this day has not lost its charm. Richardson's voltaic narcotism for a time attracted the attention of the medical and dental profession. Its inventor claimed "that by the action of a galvanic current, passing through a narcotic solution, held in contact with the part to be operated upon, some of the narcotic substance passed much more rapidly into the tissue, and that in many instances complete local anesthesia was in this way produced by solutions which are entirely inert when applied, even to the most delicate tissue, without the galvanic current." This very same principle, discovered by Reuss in 1807, and introduced by him as "electric endosmosis," or as "cataphoresis," by E. du Bois-Raymond, was "newly discovered" and reintroduced into dentistry about a decade ago. In cyclonic fashion it swept over the globe, but today it is almost forgotten. Electric or galvanic anesthesia was suggested as far back as 1851 by Dr. A. Hill, of Connecticut. Francis, in 1858, recommended the attachment of the electric current to the well-insulated handles of the forceps for the painless extraction of the teeth, and, as dental depots still offer appliances of this nature for sale, it seems that this method is still in vogue with some operators. According to Regner and Didsbury, as cited by Sauvez, a current of electricity of high frequency, when directed toward the long axis of a tooth for a shorter or longer period previous to its extraction, produces insensibility to pain. In 1880 Bonwill suggested his method of "rapid breathing as a pain obtunder," which he claimed "produces a similar effect to that of ether, chloroform, and nitrous oxid gas in their primary stages." In the early days of modern dentistry many feeble efforts were made to alleviate pain during trying operations. Chloroform, alcohol, ether, aconite, opium, the essential oils, and many other drugs were the usual means that were employed, either separately or as compounds, usually under fanciful names, for such purposes. Snape's calorific fluid, composed of chloroform, tincture of lemon balm, and oil of cloves; nabolis, consisting of a glycerid of tannic acid and a small quantity of chloral hydrate; Morton's letheon, which was sulphuric ether mixed with aromatic oils, are examples of proprietary preparations which enjoyed quite a reputation in their time. In 1853 Alexander Wood introduced a



method of general medication by means of hypodermic injections, and a few years later the French surgeon Pravaz modified the old style syringe for this special purpose, which since is known as the "Pravaz" or hypodermic syringe. At once it was suggested to apply such drugs as morphine or tincture of opium for the purpose of producing local anesthesia. The results were not encouraging, however, until cocain was advocated. Cocain was discovered by Niemann in 1859, but it required twenty-five years to make known the remarkable anesthetic properties which this alkaloid possessed when applied in the ready soluble form of its hydrochloric salt. It was on September 15, 1884, that Carl Koller, of Vienna, presented his epoch-making communication at the Ophthalmologic Congress at Heidelberg, in which he demonstrated the effects of cocain as a local anesthetic. With the introduction of this drug into therapeutics, local anesthesia achieved results which were beyond expectations, and its final adoption created a new era in local anesthesia.

*Means of Producing Local Anesthesia.* The term anesthesia (without sensation), which was suggested in 1846 by the great physician-litterateur, Oliver Wendell Holmes, to Dr. Morton, is usually defined as an artificial deprivation of all sense of sensation, while the mere absence of pain is referred to as analgesia. Correctly speaking, the term local anesthesia is partially a misnomer. In producing local anesthesia we do not fully comply with all the requirements that anesthesia demands, because a part of the sensorium—the sense of touch, for instance—is not abolished. The term local anesthesia has, however, acquired such universal recognition that it would seem unwise to recommend a change.

Anesthesia may be artificially produced by inhibiting the sensory nerve fibers at their central end-organs in the brain or at their peripheral end-organs in the tissues, thus producing general and local anesthesia. Local anesthesia may be obtained in two definite ways. We may inhibit the function of the peripheral nerves in a circumscribed area of tissue, and we refer to this process as "terminal anesthesia," while, if we block the conductivity of a sensory nerve trunk somewhere between the brain and the periphery, we speak of it as "conductive anesthesia." Conductive anesthesia may be produced by injecting into the nerve trunk proper—endoneural injection—or by injecting into the tissues surrounding a nerve trunk—perineural injection. The latter form is the usual method pursued when conductive anesthesia for dental purposes is indicated. Specific forms of local anesthesia may also be produced by paralyzing the sensory ganglia in the brain or in the spinal cord; these methods have, however, no bearing on the subject under consideration.

The successful practice of local anesthesia involves the carefully adjusted co-operation of a number of important details, each one constituting a definite factor in itself, which, when neglected, must necessarily result in failure. As a whole, the practice of local anesthesia by the hypodermic method represents the composite of the following factors:

1. A solution of active ingredients corresponding to the physical and physiologic laws which govern certain functions of the living cell.

2. A carefully selected hypodermic armamentarium.
3. A complete mastery of the technique.
4. A proper selection of the correct method suitable for the case on hand.
5. Good judgment of prevailing conditions.

*Physiologic Action of Anesthetics.* According to more recent therapeutic conceptions, it is generally recognized that a drug or combination of drugs which simultaneously produce local anemia and inhibition of the sensory nerves in a circumscribed area of tissue is the logical solution of the question of local anesthesia. Certain important factors, however, relative to the physiologic and physical action of the solution employed for hypodermic injection upon the cell govern the successful application of such methods. It is of prime importance, therefore, to comply with the laws regulating the absorption of injected solutions—osmotic pressure.

If we separate two solutions of salt of different concentration by a permeable animal membrane, a continuous current of salt and water results, which ceases only after equalization of the density of the two liquids—that is, equal osmotic pressure (according to the Boyle-Vant Hoff law) is established. The current passes in both directions, drawing salt from the stronger to the weaker solution, and water vice versa, until osmotic equilibrium is obtained. The resultant solutions are termed, according to De Vries, isotonic.

Osmotic pressure is a physical phenomenon possessed by water and all aqueous solutions, and is dependent on the number of molecules of salt present in the solution and on their power of dissociation. In organized nature these osmotic interchanges play an important role in regulating the tissue fluids of both animals and plants. In the animal tissue the circulation depends principally upon the mechanical force exerted by the heart. The life of the cell depends on the continuous passage of these fluids, which furnish the nutrient materials, consisting of water, salt, and albumin. These chemicals are normally present in certain definite proportions. The membrane of the living cell is, however, only semi-permeable—that is, the cell readily absorbs distilled water when surrounded by it. The cell becomes macerated, loses its normal structure, and finally dies. If, on the other hand, the surrounding fluid be a highly concentrated salt solution, the solution absorbs water from the cell; no salt molecules enter into the cell body proper. The cell shrinks, and finally dies. This process of cell death is in general pathology referred to as necrobiosis. Another important factor teaches that all aqueous solutions that are isotonic possess the same freezing point—that is, all solutions possessing an equal freezing point are equi-molecular, and possess equal osmotic pressure. This law of physical chemistry has materially simplified the preparation of such solutions. The freezing point of human blood, lymph, serum, etc., has been found to equal approximately 0.55 degrees C., which in turn corresponds to a 0.9 per cent. sodium chlorid solution. Such a solution is termed a

physiologic salt solution. In the older works on physiology a 0.6 per cent. sodium chlorid solution is referred to as a physiologic salt solution, and corresponds to the density of the blood of the frog. A slight deviation above and below the normal percentage of the solid constituents is permissible. When physiologic salt solution at body temperature is injected into the loose connective tissues under the skin in moderate quantities, neither swelling nor shrinking of the cell occurs. A simple wheal is formed, which soon disappears, and, as no irritation results, consequently no appreciable pain is felt. Other similar bodies that are equally soluble in water act in the same manner, with the exception of the salts of the alkali and alkaline earth metals—as potassium or sodium bromid. The latter substances produce intense physical irritation, followed, however, by prolonged anesthesia, and in the consequence are termed by Liebreich painful anesthetics. If, on the other hand, simple distilled water is injected, only a superficial anesthesia is produced; the injection itself is very painful, and acts as a direct protoplasm poison by maceration of the cell contents, which results in the death of the cell. If distilled water approximately at a ratio of ten drams to the pound of body weights is injected into dogs, they will succumb in a short time. The injection of higher concentrated salt solutions produces opposite effects; water is removed from the tissues with more or less pronounced pain, and followed by superficial anesthesia. The red blood corpuscles are extremely susceptible to any injected fluid which is not isotonic in its nature. They are universally destroyed (hemolysis) by the injection of fluids which are not represented by an isotonic salt solution. Severe tissue disturbances result, which may terminate in gangrene. Hypotonic solutions—solutions containing less than 0.9 per cent. of sodium chlorid—cause swelling of the tissue, while hypertonic solutions—solutions containing more than 0.9 per cent. of sodium chlorid—produce shrinkage. These manifestations are proportionately the more intense the further the solution is removed from the freezing point of the blood. Furthermore, hypotonic as well as hypertonic solutions require much more time for their absorption than isotonic solutions, as the osmotic pressure has to be standardized to the surrounding fluids—that is, to the isotonic index of the tissue fluids. Local anemia, or ischemia—a temporary constriction of circulation—prevents, as it has been experimentally shown, the rapid absorption of fluids that are injected into the affected area. Retarded absorption of the injected fluid, holding poisonous drugs in solution, means increased action of these poisonous drugs within the injected area. Increased action denotes increased consumption of the poisonous drugs, and, as a consequence, there is less danger from general absorption. The more important means applied for the purpose of producing local anemia are:

1. The Esmarch elastic bandage.
2. The application of cold.
3. The extract of the suprarenal capsule, or its synthetic substitutes.



Some observers have maintained that local anemia produces anesthesia. This is not, however, the case, as it is merely an important means to confine the injected anesthetic to the anemic region, and thus bring about an increased and prolonged action of the drug. Consequently the concentration of the anesthetic solution may be of a lower percentage, which, of course, lessens the danger of intoxication. For plausible reasons the Esmarch elastic bandage can not be made use of for dental operations.

Physically reducing the temperature of the body by the application of cold (ice pack, ice and salt mixture, cold metals, etc.) was practiced by the older surgeons. James Arnott, in 1848, suggested the adoption of diminished temperature as "a safer mode than any hitherto in use of producing insensibility in surgical operations," and Blundell, in 1855, advocated ice packs and salt solutions as means of producing "local anesthesia by congelation" for dental purposes. Through the efforts of Sir B. W. Richardson, in 1866, this method was placed on a rational basis by the introduction of his ether spray. To obtain good results, a pure ether (boiling point 95° F., 35° C.), free from water, is necessary. Certain other hydrocarbons possess similar properties in varying degrees, depending on their individual boiling point. In 1867 Rottenstein called attention to the use of ethyl chlorid as a refrigerating agent, and Rhein, in 1889, introduced methyl chlorid for the same purpose. In 1891 Redard reintroduced ethyl chlorid as a local anesthetic, which since has become known by many trade names, as antidolorine, kelene, narcotile, etc.—and mixtures of the first two in various proportions, known as anestol, anestile, coryl, methethyl, etc., are extensively used in minor oral and general surgery. A pure ethyl chlorid (boiling point 55° F., 13° C.) is best suited for this purpose, as it lowers the temperature of the tissues sufficiently to produce a short superficial anesthesia in a few minutes. Too rapid cooling or prolonged freezing by methyl chlorid (boiling point—12° F.—24.5° C.), or the various mixtures thereof, produce deeper anesthesia, but such procedures are dangerous. They frequently cut off circulation in the affected parts so completely as to produce sloughing (necrosis). Liquid nitrous oxid gas, liquid or solid carbonic acid (recently known as carbonic acid snow), and liquid air, all of which have a boiling point far below zero, are recommended for similar purposes, but they require cumbersome apparatus and are extremely dangerous.

*Ethyl Chlorid and its Administration.* Ethyl Chlorid—Monochlorethane; hydrochloric ether,  $C_2H_5Cl$ . "A haloid derivative, prepared by the action of hydrochloric acid gas on absolute alcohol." At normal temperature, ethyl chlorid is a gas, and under a pressure of two atmospheres it condenses to a colorless, mobile, very volatile liquid, having a characteristic, rather agreeable, odor and burning taste. It boils at about 55° F. (13° C.) and is very inflammable, burning with a smoky, green-edged flame. It is stored in sealed glass or metal tubes, and when liberated at ordinary room temperature (70° F., 21° C.) it evaporates at once. In

commerce it is supplied in plain or graduated glass tubes of from 3 to 60 grams capacity, or stored in metallic cylinders holding from 60 to 100 grams or more. To remove the ethyl chlorid from the hermetically sealed smaller tubes, the neck has to be broken off, while the larger glass and metallic tubes are provided with suitable stop cocks of various designs to allow definite amounts of the liquid to be released.

*Mode of Application.* For the extraction of teeth, immediate removal of the pulp, opening of abscesses, and other minor operations about the oral cavity, the tube should be warmed to body temperature by placing it in heated water, and its capillary end should be held about six to ten inches from the field of operations. The distance depends on the size of the orifice of the nozzle, and complete vaporization should always be produced. The Gebauer tube is fitted with a spray nozzle, which shortens

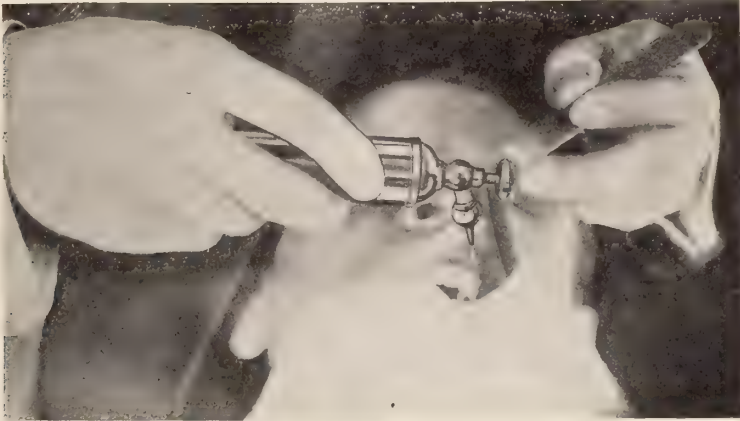


Fig. 1. Application of the ethyl chlorid spray.

the distance to one or two inches, and is especially well adapted for dental purposes. The stream is directed upon the tissues until the latter are covered with ice crystals and have turned white. For the extraction of teeth the liquid should be projected directly upon the surface of the gum, as near the apex of the root as possible, but care should be taken to protect the crown of the tooth on account of the painful action of cold on this part. Tissues to be anesthetized should first be dried and well surrounded by a film of vaselin or glycerin, and protected by cotton rolls and napkins, to prevent the liquid from running into the throat. Let the patient breathe through the nose. Occasionally light forms of general anesthesia are induced by inhaling vapor. On account of the difficulty of directing the stream of ethyl chlorid upon the tissues in the posterior part of the mouth, it is not successfully applied in those regions. The intense pain produced by the extreme cold prohibits its use in pulpitis and acute pericementitis. To anesthetize the second and third branch of the fifth nerve, it is recommended to direct the stream of ethyl chlorid upon the cheek in front of the

tragus of the ear, but the author has not seen good results from such a procedure. Caution should be exercised in using ethyl chlorid near an open flame or in conjunction with the thermo-cautery, as severe burns have resulted by setting the inflammable vapor on fire.

Within the last decade the active principle of the suprarenal capsule has evoked extensive comments in therapeutic literature. It has been isolated by a number of investigators under different names, as epinephrin by Abel (1897), suprarenin by Fuerth (1898), and adrenalin by Takamine and Aldrich (1901). Many other titles are given to this chemical—as adnephrim, adrin, paranephrin, suprarenalin, supracapsulin, hemostasin, etc. The United States Pharmacopoeia (eighth revision) has not as yet admitted this alkaloid to its pages, and, therefore, whenever we refer here to the hydrochloric salt of the alkaloid of the suprarenal capsule, we speak of it as adrenalin, the term which is at present preferred in the United States. Adrenalin is a grayish-white powder, slightly alkaline in reaction, and perfectly stable in dry form. It is sparingly soluble in cold and more soluble in hot water, is insoluble in ether or alcohol, and with acids it readily forms soluble salts. The preparation that is employed mostly for therapeutic purposes is a solution of adrenalin hydrochloride in a 1 to 1000 physiologic salt solution, to which preservatives—as small quantities of chloretone, thymol, etc.—are added. Adrenalin solution does not keep well. On exposure to air and especially in the presence of even minute quantities of an alkali it is easily oxidized, becoming pink, then red, and finally brown, and with this change of color its physiologic property is destroyed. If the adrenalin solution be further diluted, it becomes practically worthless within a few days.

When adrenalin is injected into the tissues, even in extremely small doses, it temporarily raises the arterial blood pressure, acting as a powerful vasoconstrictor by stimulating the smooth muscular coat of the blood vessels, and thus produces local anemia. Large doses finally reduce the blood pressure, and heart failure results. The respiration at first quickly increases, but slows down and finally stops with expiration. Its action is largely confined to the smooth muscle fibers of the peripheral vessels. Adrenalin is destroyed by the living tissue cells, the body ridding itself of the poison in some unknown manner. While adrenalin does not possess local anesthetic action, it increases very markedly the effect of certain anesthetics when combined with them. Very recently, it has been shown by Esch, that adrenalin possesses a specific action on nerve tissue, viz.: it prepares the latter tissue in a peculiar way so as to take up the anesthetic more readily. Esch compares this action with the use of a mordant in the dyeing industry, viz.: to “fix” the color. These observations are of vast importance in connection with the production of local anesthesia. Carpenter, Peters, Moller, and others referred to the use of adrenalin in this respect, and finally Braun, in 1902, published his classic researches, and to him and his co-workers, especially Heinze and Lawen, belong the



credit of establishing a rational basis for the production of local anesthesia. It is claimed that secondary hemorrhage frequently occurs after the anemia produced by the adrenalin has subsided, and that the tissues themselves suffer from the poisoning effect of the drugs, resulting in necrosis. Such results are produced only by the injection of too large quantities of the drug, which by their deeper action close up the larger arteries. The prolonged anemia will give way to a dilatation of the blood vessels, and, if the tissues are too long deprived of the circulation, we are able to understand why sloughing may result. Small doses of adrenalin have no effect upon the tissues or on the healing of a wound. Palpitation of the heart and muscular tremor, which were occasionally noticed in the early period of the use of the drug, are the direct result of too large doses. Recently a synthetic adrenalin has been successfully prepared by Stolz, which, with hydrochloric acid, forms a stable and readily soluble salt. It is known as synthetic supraparenin hydrochloride. The new chemical has been carefully tested physiologically and in clinical work, and the general consensus of opinion points to the fact that it is not alone equal, but in certain respects superior, to the organo-preparations. Synthetic supraparenin solutions may be readily sterilized by boiling. They are relatively stable, and their chemie purity insures uniform results. They are comparatively free from dangerous side actions. The writer's observations regarding the value of synthetic supraparenin relative to its actions and its general behavior is in full accordance with the above statements, and its advantages over the organo-preparations has led us to adopt it as a component in the preparation of local anesthetic solutions. For dental purposes—that is, for injecting into the gum tissue—the dose may be limited to one drop of the adrenalin solution (1 to 1000) or the synthetic supraparenin solution (1 to 1000), added to each cubic centimeter of the anesthetic solution, 5 drops being approximately the maximum dose to be injected at one time.

Ever since the introduction of cocain into *materia medica* for the purpose of producing local anesthesia, quite a number of substitutes have been placed before the profession, for which superiority in one respect or another is claimed over the original cocain. The more prominent members of this group are tropacocaine, the eucaines, acoin, nirvanin, alypin, stovaine, novocaine, and, very recently, quinin and urea hydrochlorid. None of these compounds, with the exception of novocaine, has proved satisfactory for the purpose in view. The classical researches of Braun have established certain factors which are imperative to the value of a local anesthetic. These factors concern their relationship to the tissues in regard to their toxicity, irritation, solubility and penetration, and to the toleration of adrenalin.

There is no need at this moment to enter into a discussion of the pharmacologic action of the drugs usually classified as local anesthetics. Let it suffice to state how the above-mentioned drugs fulfill the demands of Braun. Tropacocaine is less poisonous, but also less active than cocain,

it completely destroys the action of adrenalin; the eucaines partially destroy the adrenalin action, they are, comparatively speaking, equally as poisonous as cocain; acain is irritating to the tissues and more poisonous than cocain; nirvanin possesses little anesthetic value; alypin and stovaine are closely related, producing severe pain when injected, which occasionally has resulted in necrosis. Quinin and urea hydrochloride reacts strongly acid and, as a consequence, severely damages the tissues in the injected area. As we have recently shown elsewhere it possesses no advantage when employed as a local anesthetic in dental operations but has many disadvantages as compared to cocain or novocaine.

Novocaine alone fully corresponds to every one of the above claims. Its toxicity is about two to six times less than cocain; it does not irritate in the slightest degree when injected, consequently no pain is felt from its injection per se; it is soluble in its own weight of water; it will combine with adrenalin in any proportion without interfering with the physiological action of the latter, and it will be readily absorbed by the mucous membrane. The studies of Biberfeld and Braun brought to light another extremely interesting factor concerning the novocaine-adrenalin combination. Both experimenters, working independently of each other, observed that the adrenalin anemia on the one hand, and the novocaine anesthesia on the other hand were markedly increased in their total effects upon the tissues. Consequently, a smaller quantity of this most happy combination is required to produce the same therapeutic effect as a large dose of each individual drug alone would produce when injected separately. The injection of a solution of the combined drugs is precisely confined to the injected area, general effects are therefore rarely produced.

Novocaine is the hydrochloric salt of a synthetically prepared alkaloid, the methyl ester of p-aminobenzoic acid. It is a white crystalline powder, or colorless needle-shaped crystals, melting at 263° F. (156° C.). It may be heated to 200° F. (120° C.) without decomposition. It dissolves in an equal amount of cold water, the solution having a neutral character; in cold alcohol it dissolves in the proportion of 1 to 30. Caustic alkalies and alkaline carbonates precipitate the free base from the aqueous solution in the form of a colorless oil, which soon solidifies. It is incompatible with the alkalies and alkaline carbonates, with picric acid, and the iodides. Its solutions may be sterilized by boiling without decomposition.

As stated above, the relative toxicity of a given quantity of cocain in solution depends upon its concentration; this same peculiarity is not shared by novocaine. The dose of novocaine may be safely fixed at one-third of a grain for a single injection. For dental purposes a 1½ or a 2 per cent. solution in combination with adrenalin has been injected without any ill results. For the purpose of confining the injected novocaine to a given area, the addition of adrenalin in small doses, on account of its powerful vasoconstrictor action, is well adapted. It is the important factor which prevents the ready absorption of both drugs and consequently

largely nullifies poisonous results. An injection of 10 drops of a 2 per cent. solution of novocaine labially into the tissue produces a diffuse anesthesia lasting approximately twenty minutes; the same quantity, with the addition of one drop of adrenalin chlorid solution increases the anesthetic period to over one hour, and localizes the effect upon the injected area.

A suitable solution of novocaine for dental purposes may be prepared as follows:

℞ Novocaine .....	10 grains
Sodium chloride .....	4 grains
Distilled water .....	1 fluid ounce

Boil.

To each syringe-ful (2 c. c.) add 2 drops adrenalin chloride solution when used.



Fig. 2. Hypodermic tablets, dropping bottle with dust cap and glass dish for making the anesthetic solution.

A sterile solution may be made extemporaneously by dissolving the necessary amount of novocaine-adrenalin in tablet form in a given quantity of boiled distilled water. A suitable tablet may be prepared as follows:

℞ Novocaine .....	1-3 grain
Synthetic suprarenin hydrochloride.....	1-1200 grain
Sodium chloride .....	1-3 grain

One tablet dissolved in 20 minims of sterile water makes a 2 per cent. solution of novocaine ready for immediate use.

Solutions for hypodermic purposes should preferably be made fresh when needed. A small glass dish and a dropping bottle constitute the simple outfit for such work. The dropping bottle should hold from 1 to 2 ounces. A suitable one is made by the Whitall-Tatum Co., of Philadelphia, and may be bought in the drug shops. It should be provided with a dust cap. "A groove on one side of the neck of the bottle, and a vent on



the other connected with two grooves in the back of the stopper allow the contents to flow out drop by drop. A quarter turn of the stopper closes the bottle tightly." The water used for making the solution should be boiled and filtered, distilled water. The hypodermic solution can be made extemporaneously in a few seconds: Place a tablet in a sterile glass dish, add 20 minims (1 c. c.) of water, and to facilitate the solution, mash the tablet. The solution is now ready for immediate use.

(To be Continued)

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## THE DENTIST—GUARDIAN OF THE GATEWAY TO NUTRITION\*

By S. M. Stauffer, D.D.S., Pittsburg, Pa.

IT IS with reluctance that I attempt to write upon this very important subject — a subject which has never, to the best of my knowledge, been discussed by a dental society.

The dentist's requirements, medically and mechanically, have often been considered; but, in the light of "Guardians of the Gateway to Nutrition," they are new to most of us, as I shall attempt to present it.

It may seem presumptuous in me to say that dentists should have a more extended knowledge of nutrition, but such, nevertheless, is the case; and in presenting this subject I am aware that I tread upon ground little explored; the study of which requires deep thought and its presentation much temerity.

We who are looked upon by the laity, as well as by our learned medical colleagues, as being equipped for the practice of a learned profession, should have a knowledge of nutrition.

The proper use of food is logical, but to indulge in foods when sick, under the vain thought that it will "keep up strength," even though there be no hunger, is a violent violation of Nature's laws. Such signals as lack of desire should be observed carefully, for they are warnings that she has gotten behind in her work and demands a chance to catch up. Food taken under these circumstances is but partly digested — if at all — and ferments and decomposes, producing auto-intoxication. Dr. Dewey said: "Take food away from a sick man's stomach and you have begun, not to starve the sick man, but the disease."

We should possess such knowledge as will aid us in prescribing more intelligently for the needs of our patients than hitherto. If we are to be Guardians of the Gateway to Nutrition, we must have knowledge of the value of foods as *food*, and to know how to aid and direct patients in making proper selections, together with their preparation. This requires an extension of knowledge beyond the mere filling of teeth or the making

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\*Read before the Odontological Society of Western Pennsylvania, 1911.

of artificial substitutes. But, once in possession of the knowledge, it simplifies living to an extent by reducing the drudgery of the culinary department by more than half, and to such as are interested, from a purely mercenary point of view, it *must* commend itself — especially so since the enjoyment of the food will be an unusual delight to the most fastidious epicure. If any one of you is inclined to doubt this statement, let him but wait for true, physiologic hunger to assert itself; then note with what gustatory delight the simplest foods will be relished.

If we were all leading a normal life, spending plenty of time in the open air, Fletcherizing our foods, not using all of our stored-up energy in "the strenuous life," having peace of mind, perfect poise, harmonious surroundings, plenty of fresh air and diaphragmatic breathing, exercising in plentiful and pleasurable form, eating only when physiological hunger asserted itself — to satisfy hunger, not appetite — then we would likely select our food with intelligence, and the matter of nutrition would need but little attention.

Unfortunately, however, this is the age of conventionality. The conventional life of the past, with its complicated feast-day menus and the illogical and too frequent hours of food indulgences, has ruined the teeth of mankind and rendered the existence of our profession necessary. Little did Benjamin Franklin realize the import of his saying, 170 years ago, that "America was noted for her poor teeth, and as a soup-eating nation." This remark certainly implies that they were, even then, eating of foods much too soft; not well selected, nor prepared in the manner required for use in the development of dental organs. And conditions have grown steadily worse, until within a decade or two, since when there have developed changes in some of our methods of thinking and doing.

Cooks, in their imagined wisdom, have for years been soaking and parboiling foods and throwing away the *mineral* food salts, under the impression, no doubt, that they were getting rid of the "non-nutritious" — the injurious elements. Whereas, the truth is, they have been soaking and parboiling out and throwing away the salts most needed in foods, and all this done, no doubt, with the notion that it added to the "gustatory delight." In cooking foods, none of the water should be thrown away. Many of the foods so treated are the ones richest in soda and lime, the mineral food-salts in which so many foods are deficient. Those rich in soda and lime salts which are treated thus are cabbage, spinach, onions, beets, dandelion, stinging-nettle, cucumbers, potatoes, asparagus, rice, etc. Meat, too, is soaked by some people until much of its food-salts are lost. This should not be done *if you are going to eat the meat!*

One of our recent philosophers, Horace Fletcher, has done more, in my opinion, to help mankind in its present deplorable, debauched condition than any other living mortal. In our present manner of eating we gluttonize. We do not eat-to-live, as we should, but we make ourselves a close second to that omnivorous creature which eats, grunts and squeals

and then hangs, head down, in the market stalls. And in consequence a large portion of the food we eat only ferments and decomposes — rots — in the alimentary canal, the results of which are much distress and suffering. We call this *disease*. Yes, dis-ease, not at ease.

When I say “debauched” I don’t mean “wallowing in the gutter,” as is so frequently meant in reference to alcoholic inebriates. But I do mean we create troubles brought on by intemperate habits of eating which, in reality, are just as degrading as those of the individual who indulges in the gutter escapade. In making this statement I do not except those who pose as the élite of society, nor the learned doctor; for they, as we, succumb to violations of natural law — just as surely as a law is broken. I might go on at this rate indefinitely. But time forbids.

Regarding your duties as Guardians of the Gateway to Nutrition, you may ask: “Where do they begin?” They begin with the little child in your chair; for it is hard to teach the “old dogs new tricks.” Teach the children the importance of the dental organs and how to care for them — physiologically as well as prophylactically — which latter word is here used because *you* use it and that because it “sounds” better — more “professional” — than the real word “sanitary,” which ought to be used. I dare say that had you, when a child, been taught to care for the teeth, physiologically (and this includes both prophylaxis and sanitary means), to select foods offering resistance enough to be cleansing and to exercise the teeth and gums sufficiently to develop them into strong, healthy organs, together with the use of brush, floss and picks, you would be happier, healthier, and have better teeth.

Go back one week in your memory and note if you have had, at any meal, enough solid, resisting food which would in its excursions over the sides of the teeth and gums drive the colonies of those apparently harmless emigrants from their camp. The manner of preparing foods today would, in reality, enable us to get along without teeth — were it not for the necessary mixing-in of the saliva. Hence, the time seems ripe for an awakening to the facts. Ascertain for ourselves, then instruct our patrons in the importance of caring for their dental organs — not alone with reference to sanitation, but in the manner of using them for the purpose of getting *nourishment* — not auto-intoxication — from the foods they employ.

To become a Guardian of the Gateway to Nutrition, it is necessary to know the *reasons* for such guardianship — the *reasons* for decaying teeth — other than the supposed “purely bacterial” ones; the *reasons* for the secretions of the mouth becoming so abnormal that caries are inevitable — despite the lavish indulgence in “antiseptic” washes and powders; the extreme care, personally, as well as at the hands of a competent dentist.

To find these *reasons* and remedy them will be doing a vaster good for mankind than the discovery of an invisible, indestructible and painlessly inserted “filling material.” These *reasons* may be discovered in a com-



parative study of life in the evolution of our race. The history of our barbaric ancestors dates back many years. What was their diet? We know this sufficiently well, through study of anthropology. From the shape of our teeth, many have formed the opinion that we are frugiverous; some carnivorous, and others omniverous. The teeth, however, play the least part in determining this point. Study will reveal that the mammary glands, the colon, the tongue, the skin, the nails, the salivary glands, the teeth, and the attitude in walking all play an important part in deciding this important question.

There is no doubt, however, that our teeth do belong to the type of the frugivorous animal; and, from the proofs available, it is certain that the diet of our remote ancestors was chiefly fruits and nuts.

We have no knowledge as to the extent to which meats were used as foods, but in times of scarcity they may have resorted — as the horses of the northwest Norwegian coast have been known to do — to plunge into the sea to catch fishes when driven to this extreme by starvation.

As to the characteristics of the mineral salts in a diet of fruits and nuts we find, on examinations of the ash, from five to ten times the quantity of soda and lime, as compared with that found in the diet as prepared for man today. The other mineral salts are about in the normal proportion.

In view of the fact that our diet is so woefully lacking in the soda and lime salts, is there any real wonder in the degeneration — caries — of tooth structure?

In some cases of osteomalacia (a morbid softening of the bones) the deficiency in soda and lime is found to be 60% below normal.

The cause of rickets and rickety teeth is now known to be largely due to diet, deficient in mineral salts.

It can hardly be doubted, either, that the early loss of the third molars, the ugly, soft, yellow crowns of the other molars and bicusps and the general lack of "resistance" in so many teeth cannot be due to causes other than an insufficient supply of the lime salts.

These statements are based upon facts gleaned from "Natural Hygiene," by H. Lahmann, M. D., and I believe them to be the keystone of the situation.

Note the fact that the babe at the breast gets milk only fair in soda and lime. Whereas, the Indian babe — the papoose — is fed at the breast until it is nearly three years old, and decayed teeth amongst these people is very rare.

In artificial feeding the milk or cream is diluted from two to four times, thus lessening the quantity of food salts to about 25% to 50%.

Now you will ask me to define the diet which may give us the normal amount of food salts. What I have to say shall be general in its application, because — even to those who may have no teeth — it is a factor in the prolongation of youth — the maintenance of health.

In the first place it will be necessary to set aside our "conventional menu" and adopt one of those recommended by Drs. Tilden, Lahmann, Bunge, or any of that class of naturalists, who condemn the too prevalent use of meats, broths, eggs, starches or cereals, stimulants, pulses, cheese, etc., and in their stead eat, almost exclusively, of green leaf and root vegetables, green salads and juicy fruits.

You will recognize the fact that the raw — or sun-cooked — vegetables and fruits are of the utmost importance in the development of the teeth and jaws of children, which is very significant, especially if the food be well selected with regard to the "food" or mineral salts. These foods are firm in texture and require more careful attention in the matters of mastication and insalivation than can be the case of the cooked, starchy and soggy foods our tables chiefly abound in.

If we look up the diet of our prehistoric ancestors, we will discover that it consisted of meats, nuts, tropical fruits, succulent roots, leaves and vegetables, wild honey and, may be, a few other simple, uncooked foods. There was no bolted flour; no cooking and parboiling, then carefully draining off the best portions and eating *the residue*, which is done in our enlightened civilized homes today. This, with their "out-door life," constituted their "simple mode of life."

If we compare their diet with our own, observing the difference in the quantity of food salts, we find a definite contrast, accounting possibly in a large degree for the definite shortening of life's span, as shown by the insurance companies' tables. Another disadvantage, too, under which we labor is in the fact that our foods are all prepared for us by "skilled" cooks, who possess no knowledge of the value of combinations other than for the mere production of flavors to pander to "appetite."

I want to call your attention to a few points which will be well for us to consider if we are to live in accordance with "the best knowledge obtainable today." It is true we are sadly in need of knowledge whereby we can better control our physical conditions; but if we will use that which is available we shall do much better than can be possible in the "conventional" life which most of us have been "brought up to."

Many of you no doubt think our present diet is a recent invention; be that as it may, we may judge from what Benjamin Franklin said, that there was something radically wrong in its selection and combination nearly two centuries ago. Why? Simply because they were living the "conventional life" — out of balance in a variety of ways.

In such a diet as was used by our prehistoric ancestors the food-salts were well balanced. Compared with the diet of today, there is a vast difference. Our diet contains excesses of potash, iron, sulphuric acid, etc., and is deficient in soda, lime, phosphoric acid and chlorin.

Gardeners, farmers and stock raisers are thoroughly drilled in their specialties. But in the raising of their children — ! Hygiene should be taught in a manner easily understood by tots even. You might think it

hard, or even impossible, but I want to say the child is easily taught and will grasp the subject securely if given the opportunity. The trouble, however, is that "grown up" children — those with the gray hairs — are deficient in their knowledge of these things, and as a natural result there is improper feeding of the younger generations; hence, epidemics rage and mankind suffers. Plant life also suffers from want of proper mineral substances.

Dr. J. H. Tilden of Denver, Col. (whom Dr. Charles A. Du Bois of New York considers the greatest living authority on dietetics) says if the Southern people afflicted with "hook-worm" will cease the use of pork and use only a reasonable amount of cream or refined cottonseed oil for shortening their bread, then see to it that nuts, eggs, chicken or fish are used to the *exclusion* of other meat foods and *never eaten oftener* than once during a day, in conjunction with a dinner plateful of salad made by combining lettuce, cabbage, celery and tomatoes — dressed with a little salt, sugar and *lemon juice* — not vinegar; and one meal a day of fruit, cheese and milk, "I will guarantee there will be no hook worms in the intestines of those who adopt such diet within one year after its adoption." But *their fields must be fertilized* with something containing potash, soda, lime and magnesia, as their soil is in a state of degeneration.

Neither soil nor the people can be cured by dosing with thymol and salts. Give back to the earth the elements necessary for "man-building" and she will go out of the hook-worm business.

In healthy organisms fat is formed from the fats in food and from carbohydrates; while, in morbid conditions, the *incomplete* oxidation of albumen seems to be the principal source of fats, as is shown in the accumulations of abnormal urine constituents, and explains why fat persons are more subject to kidney diseases and gout.

Lean persons worry themselves in their endeavors to get stouter, by eating and drinking, but fail. Why? The following experiments, by Foster, will illustrate: He fed three pigeons white bread and casein, either of which contains few food salts; they lived thirteen, twenty-five and twenty-nine days, respectively. He next fed two dogs on meat deprived of its food salts (by soaking), some fat, sugar and white bread; the dogs were at the point of death on the twenty-sixth and thirty-sixth days. Dogs, completely deprived of food, will live from forty to sixty days.

Dr. J. H. Kellogg, Dr. T. J. Allen and Mr. Bernarr Macfadden have each experimented with dogs, apparently under the same conditions, feeding one with bread made from *bleached* white flour; one with bread made from white flour, and one with bread made from the "whole-wheat" flour; while a fourth dog was fed nothing at all. The dog fed with bleached flour bread died first; the one fed with white flour bread died next; the one fed nothing died third, while the dog fed with whole-wheat flour bread apparently thrived — did well.



The process of bolting flour removes the mineral, or food salts. Bunge proves this by means of experiment. He shows, also, that the sulphuric acid, formed from the sulphur of albumen, finding no food salt basis to combine with, destroys the living cells.

The treatment of bad cases of lean dyspeptics is difficult; it requires a long time. And to obtain results they must give up their senseless notions concerning "generous diet," meat, broths, eggs, beer, pulses, cereals, cheese, etc. Such cases will not improve until they can obtain proper quantities of soda and lime with their food, which should consist largely of green vegetables, green salads and juicy fruits.

It is difficult to make people understand that the same diet can produce corpulency in one person and "leanness" in another; but experience teaches that this is actually the case — one person possessing a more active heart than the other. In one case the blood is diluted, owing to the weaker action of the heart, and the albumen is transformed into fat, and in this form protects the tissues from attacks of acids. With the stronger heart's action the reverse is the case.

If uric acid is a prominent factor in the development of disease, may it not be probable that it interferes with the development and aids in the destruction of the teeth? I most certainly think so.

It is a fact well worth considering that the urine of carnivorous animals — such as the dog and cat — is, usually, quite free from uric acid; whilst that of the human animal varies, according to the food taken. If vegetable food alone be consumed the urine will, like that of the herbivorous animals, contain only traces of uric acid.

Man is the only animal existent which suffers from uric acid troubles. Could this arise from any cause other than the wrong choice and use of foods?

According to Landois and Sterling, the amount of uric acid daily excreted through the kidneys is 32.5 grains on a flesh diet, and from 3 to 10 grains on a non-flesh diet.

When we recognize the fact that uric acid is a product of imperfect nutrition, that it is the result of stuffing the body with excessive nitrogenous wastes, the figures above become more than significant. If a meat diet increases the amount of uric acid found in the urine from three to ten times that resulting from a simple, natural diet, is not the question well worthy of careful, earnest consideration?

Our present "practice of medicine" consists, almost wholly, of "*treating the symptoms*" — rheumatism, skin diseases, nervousness, etc., etc. The lack of any system which treats the *cause* of disease; the want of a proper *system* of prophylaxis; the want of *success* in the present system of therapeutics, and the rapid growth of "quack medicine" are all explained by our simple ignorance of *the cause of disease*: call it "primary" or what you choose — it's still the *cause*!

Animals have preserved their instincts with reference to choice of foods. Man has the disadvantage of "cultivated" (?) tastes; not alone with reference to tobaccos, liquors, opiates and condiments, but *foods* — their ill-judged mixtures as well as their ill-timed indulgences.

We know that the food of man should contain certain amounts of albumen, fats, carbohydrates and inorganic salts. Of the three former elements the amounts have been pretty well determined. But the man who eats albumen, fats or carbohydrates alone or in proportion inadequate to the needs of the body will sicken and die. So, also, would he sicken and die if he ate chiefly or if he avoids the soda, the lime or the iron salts.

A great many imagine, when speaking of food salts, that the common chloride of sodium (table salt) is referred to. This is not at all the case; nor does this grade of "salt" aid digestion, form bone or perform any other physiologic gymnastics. It is one of the natural *excretions* of the human body and need not be taken, in its "manufactured" form, for the only use to which it can be put — excretion!

Our unphysiologic living is well shown in what Dr. Ellen Goodell Smith said: "There is not a farmer in all the land who would dare to feed his cattle on the impoverished food he places upon his own table."

I wish to say that we have departed so far from "Nature's Laws," which are "God's Laws," by our criminally erratic conventional habits and customs that we have lost our instinct in the matter of choice and preparation of food. If our intuitive faculties — good sense — were in reasonably active order, there should be no such thing as disease. Health and supreme happiness should reign. Our instincts, however, were lost long before we were able to creep. Even at the moment of our birth the nurse or the mother, who have been tutored in the violation of Nature's laws, begin the spreading of "bad habit" by premature feeding; and insist upon its early and complete cultivation by incessant repetitions at intervals of *two hours* — thinking she knows "Nature's Laws" better than the innocent naturalist (which it would be if left alone). What is the natural result? Food instinct is frightfully interfered with, and finally lost. Dr. C. E. Page of Boston said: "If the meddlesome mothers would only leave the babies alone, with regard to their feedings, we would have to do with them as we do with surplus kittens and puppies — drown 'em!"

Dr. Page advocates the feeding of babies not more than three times daily. At birth is the period of life when the child should be "started right." It is then the foundation of temperance or intemperance in all things is laid; and intemperance in the matter of food started at this period of life and continued (which is, I think, the greatest error committed by mankind) warps the bodily and mental structures, so that disease or crime are the natural developments. And crime is only an expression of disease — *not anything else!*

Dr. Page lost his first wife and three children. Realizing something was wrong in the method of treatment, or elsewhere, he began the study

of medicine; then Nature's "cures." Afterwards he re-married and has had five children, ranging in age from five to sixteen years, during which periods not one of them has experienced a day's sickness — not one of them was drilled to such torture by a cultivated habit of over-eating!

If all children were raised like those of Dr. Page the dental and medical professions, as now existent, would waft kisses of farewell from their hands ere they shifted to more needed fields of usefulness!

Oral hygiene, as now heralded, is a noble movement on the part of an unselfish profession. It realizes the distress of suffering children, and I glory in the desire to aid and relieve this dire and depraved condition of the little ones. It will help them physically, mentally and spiritually — spiritually away beyond the fondest expectations of the instigators of the movement. But you are looking only at one phase of this vast subject. It is not charitable to supply the needy with money and food. Rather is it more of a charity to place them in a position where they may earn such money and food as they require, without expecting it to be handed them without personal effort upon their own parts. Hence, I say, continue the "Oral Hygiene" movement if you like it; *but*, for the sake of suffering humanity, let us strive to get at the root of this great evil and see how nearly we may come to correcting it. "Impossible?" Yes, it looks that way, especially since our own beloved profession, our medical colleagues and our learned professors in the arts and sciences know little or nothing of the matter of building good constitutions — good teeth. They have never given this feature of the subject a thought — beyond their own desires to gluttonize and gourmandize, with blind faith hitched to drug stores.

Now, I have a proposition to make: Inform yourselves upon this subject in some manner. If you cannot find it in books, create it! Dig it up somewhere — by personal experiments. A little conscious awakening, a little determination — a start, and the world may be revolutionized by you!

I have suggested to you, from our dental standpoint, the deficiency in soda and lime. Suppose you do, as did Dr. Lahmann, "try it on the dog." Of course, the "human dog" is rather inclined to fear "experimenting" upon himself, but how else may we determine the value of foods? Of course, if there be upon the table (and we indulge in them) from half a dozen to twenty — and sometimes more — different articles of food, we may expect no results other than those with which we are and have been accustomed to.

While in New York, on one occasion, I visited B. Lusts' bakery, where they said they burned their stale whole-wheat bread. In reply to my query. "Why don't you give it to the army of poor people surrounding you?" they replied: "They won't eat it! This is what they want," pointing to a mass of cheap, sugar-coated cakes and pies.

The place to start this reform is in the public schools. Teach the pupils the most desirable foods for the upbuilding of good teeth; tell them how to



live, to avoid anger, worry and depression, which interferes seriously with the physiologic functions — digestion, assimilation, and elimination — the healthful maintenance of the whole body, and in time, however long it may prove to be, we shall have a race of people with *good teeth*.

I can think of nothing of any more importance than to teach these children how to select and prepare their food as referred to above.

A matter so eminently practical must also be treated practically.

So important a matter as feeding, the foundation and mainspring of bodily and mental, individual and social health, deserves the best work of the highest minds.

#### DISCUSSION

DR. TUFTS: The facts presented by Dr. Stauffer seem to me to be fundamental in the cause of dental caries. By comparison, oral hygiene and prophylaxis is but a crutch for the present generation, and will have but a minor effect in the evolution of the teeth of mankind, while we know what a major factor diet is in the development of animals and man, especially such a change as a great reduction in the salts of soda and lime.

We know that the diet of the race for 300,000 years was game, fruit, nuts, with succulent roots and leaves. The ash of such foods in any likely combination contains an abundance of all mineral substances required by a normal body. The average diet of today is deficient in the salts of soda and lime, containing but from 20 to 50 per cent of that of our barbarous ancestors.

The skulls of even the 17th century show full sets of teeth. The greatest change which has occurred in diet since this time is a vastly increased consumption of decorated cereals, which were already deficient in lime and soda, which is so weakening to the system that they now recognize the use of polished rice as the main factor in the cause of beri beri disease. Evidence of the bad effects of a deficiency of mineral salts is rapidly multiplying.

These facts are to me very striking, and I think we are now beginning to reach some of the broad foundation stones of the cause of dental decay.

To get the necessary food salts we should eat the whole grain and more fruit and green vegetables, reducing the amount of cereal products. At least one meal a day should be vegetables and fruit, without any starchy food.

The best foods to balance a diet in this respect are spinach, lettuce, asparagus, cabbage, apples, grapes, oranges, peaches and pineapple.

DR. STAUFFER (closing): When people with gray hairs do not know how to teach, what can you expect? Only disastrous results, of course.

I am not a vegetarian, although I believe we would all be better off without meat.

Our intemperance in eating is not the result of human nature, but of our bad habits. Give Nature a chance by abstemious living or fasting to burn up the clinkers and make new blood, and she will do it. If the thin person who eats too much will eat (for a period) little enough he will begin to gain weight, that is if he has a reasonable selection of food, rich in mineral or food salts.

In answer to Dr. Rinehart's question, would say that if you had not fed your typhoid fever, you would have been out of bed in very much less time. I have known cases of typhoid fever to burn out in much less time. I don't believe in *feeding in any fever*, for a fever is produced by Nature getting rid of an excess of fuel.

Children need foods that will build tooth tissue, and should not be deprived of the mineral salts in food. Dr. Black tells us that tooth structure does not change, and we will cheerfully accept Dr. Black's opinion because we have no better authority.

To summarize, decay is caused by abnormal living, which causes an abnormal functioning of the body, which produces abnormal oral secretions.

## SADDLE BRIDGES.\*

By Dr. H. K. Kellogg, Louisville, Ky.

THE subject selected is one that has been presented before to this society, but the discussion and help derived at that time was of such great value to all, it was decided to try and make it again helpful. This particular department of our work has broadened and expanded greatly until now it is almost indispensable.

Many cases are dismissed with partial plates, the dental surgeons and patients thinking the service rendered is the best and only solution, when really a deeper appreciation of the patient's welfare and comfort, and the demands made by the appliance, call for a well-constructed bridge or bridges.

In your own practice what do you do with those partial cases demanding more than a celluloid, rubber or gold plate? Are you satisfied with your equipment for the care of such cases?

The saddle bridge has passed the experimental stage and has, beyond doubt, proven its value as a means for dental restoration. Are you sure the dental ridge will tolerate and endure under the varying pressure of the dental plate? Then are we assured the saddle principle has its place in bridgework?

It is well to consider the somewhat modified plate principle as used in our bridgework. Partial plates generally are not provided with attachments preventing the settling of the plate, nor is it prevented from sliding or moving on the ridge.

This is where we have been making our mistakes, and in a measure accounts for failures to construct a partial plate furnishing continued usefulness as a true substitute for the lost dental organs.

In the fixed saddle these changes of position cannot occur, and in the removable it should be the same, namely: no allowance for settling and drifting of the saddle from its original and intended position.

Will the dental ridge under a fixed saddle continue to offer the same support where there is made no allowance for any change whatever in the abutment piece either for settling of the plate or by absorption of the ridge? Will the resulting pressure, due to force of mastication, cause a change of the abutments until the ridge again offers its proper support or the appliance is beyond the reach of stress?

There seems to be one principle that is more or less forgotten in the construction of these bridges, and that is the abutments used are not sufficient to give the saddle ample support. A large per cent of the pressure brought to bear on an extensive saddle appliance is borne by the abutments; and in a well-constructed piece the movement of the saddle under

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\*Read before the Kentucky State Dental Society, 1911.

pressure does not cause any greater movement of the abutments than these teeth would undergo normally when alone. My experience leads me to believe that the ridge continues to offer its proper resistance under a saddle, whereas under some other appliance it would change.

The cantilever bridge offers us some valuable lessons in constructing our saddles. We all have seen these bridges stand for years, giving good service and remaining in their proper position. Of course, I mean the cantilevers in the bicuspid and molar regions, and also the dummy having a full occlusal surface. But we have about discarded these bridges because of the great number of failures. If the cantilever dummy had been constructed as we now construct our dummies, resting upon the ridge with some pressure, do you think this would lessen the number of failures? No doubt this would help, but it would not solve the problem entirely. We would find the dummy resting too heavily upon the ridge and finally be imbedded in the gum. The lesson to be learned is that the ridge, covered to offer sufficient support, must be greater than the occlusal surface of the dummy. This, with the fact calling for ample support from the abutments, gives us a real and broad field for working out many satisfactory appliances.

All saddle bridges must have a close-fitting saddle, even distribution of pressure on the ridge, proper and sufficient anchorage, the teeth borne by the saddle arranged as directly over the ridge as the case permits, and an intelligent understanding of the appliance by the patient. All persons wearing these bridges certainly value them more than a plate, and thus you are aided in giving more time and thought to its construction and care.

The fixed saddles have many advantages over any other appliance, ease in cleaning, not demanding any more care or attention than the adjoining teeth; freedom from annoyance of removal to cleanse, ease of mind, knowing it will not loosen or be misplaced, and a feeling of permanency and security.

Realizing that all cases demanding saddle restorations could not be satisfactorily remedied with the fixed piece, the demand for a removable abutment piece became necessary and urgent. A few of these contraindications: ridges not being hard, firm and well shaped, recent extractions, remaining roots, peculiar muscular attachments to ridge, patients demanding something removable, and mouths in which such an appliance would not be appreciated.

The danger and difficulty in the field of removable work, of course, has been the abutment piece that would be simple, strong, rigid, adjustable, adaptable — rigid and strong enough to stand the great stress and strain, and when out of the mouth not be easily changed by the patient; adjustable, permitting of loosening and tightening; adaptable to the varying conditions and locations in which such an appliance must be used; simple, easily manipulated, comfortable to patient as regards size and finish.

#### DISCUSSION.

The discussion was opened by Dr. Harry Lee, which was as follows, viz.: I heartily approve of this most excellent paper, only I wish the essayist had told us something of



the very painstaking technique that is absolutely essential to the success of the saddle bridge. The author's statement that "saddle bridges are thoroughly practical" should, to all who know Dr. Kellogg, be conclusive.

The saddle bridge will not tolerate the careless, slipshod construction that so often we see in the fixed appliance and yet be, in a measure, successful, but must be constructed with much skill and patience and that, to my mind, is the chief reason we see so few successful saddle bridges. Bridges of all sorts as we see them today present a great many failures and will continue to do so so long as the busy operator attempts, with the assistance of some mediocre workman, to construct these appliances.

The success and practicability to which all form of bridgework is entitled will come only with the advent of the skilled crown and bridge specialist, which, I believe, must soon be a special branch of dentistry. From much observation, I have concluded that the author is correct in the statement that attachments for partial plates and removable bridges should be constructed in the majority of cases with no allowance for settling, and the edge will continue to offer its proper resistance, where under continual pressure, absorption would take place.

Dr. Lee's discussion was followed by Dr. Prothero, who stated that he agreed with the essayist thoroughly with reference to the removable saddle bridges in general practice, but he was not in favor of the fixed saddle bridge; that in his experience, they did not perform the service that he desired for his work in the mouth; that he had always found that it was only a question of time until there would be more or less food found in a state of decomposition beneath the saddle, which was a very undesirable condition to have in the mouth. That some years ago he had been a very great enthusiast of fixed saddle bridges, but as time passed on he had seen these bridges all returned in a more or less serious condition as regards the health of the gums, and that he thought much less of them at present and was not at all in favor of the use of the fixed saddle bridges in his practice. In his opinion the Roach attachment, in combination with the clasps and splint pin crown, were all good attachments for removable saddle bridges. In any instance, the removable type was invariably the best.

Dr. Rose said that he had used the fixed saddle bridges for some years, and that in his experience he had noticed that most of the cases which had proven practical and given good service were, in most instances, bridges which had been made by Dr. Kellogg when he was practicing with him. However, he did not attempt to claim that he invariably had success with the fixed bridge but that the bridges could be used for a period of some years without inconvenience from bad odor and hypertrophy, and that in the main the number of successes in his practice far exceeded the failures to the extent that he felt justified thoroughly in the use of this type of bridgework, and that in his experience they gave good service for a period of from three to twelve years.

Dr. Leete said that he thought in cases where the bridges were small, with one or two teeth to the saddle, that they were practical, and that he had very satisfactory results in several instances with this type of bridgework.

Dr. Byram said that in the majority of instances he thought the removable saddle bridges were preferable to the fixed saddle as he had seen too many instances of serious results following their adjustment. In his opinion, the Gilmore attachment was the most practical for removable bridges; he thinks that the attachment should be made near the gum line, so that there would not be so great a tendency towards loose abutments under the stress of mastication. In his opinion, the principles of physics should be thoroughly acquainted with and most strictly followed in the construction of this class of bridgework.

In closing the discussion Dr. Kellogg thanked the members present for the cordial reception which had been granted his paper and appreciated very much the good points which had been thrown out by the discussion, as he hoped to profit by them, but that in his practice and in his hands he had had sufficient number of successes, in cases where they seemed to be indicated, to justify him in continuing their use in certain instances.

## NECROSIS\*

By Dr. M. H. Daily, Paris, Ky.

**N**ECROSIS is death en masse, a loss of nutrition in a definite area, a starved area becoming of the nature of a sluff, when inflammation has set in, to circumscribe and cast off dead parts.

In the maxillae we find it more frequent in the lower than in the upper jaw bone, due to the arterial supply. In the upper maxillae the arterial supply comes through many twigs of an artery surrounded by soft tissues. So many branches are there of this vessel that one of the superior maxillae has several arterial divisions, making collateral blood supply almost a certainty, at least sufficient to limit the amount of destruction. On the other hand, the inferior maxilla has the one main trunk, and should that be cut off by starvation of any particular area, that part would be more seriously affected. We believe necrosis of the jaws always has its beginning as periostitis due to some dental injury, or action of some specific poison or causative agents, such as syphilis, mercury, scarlet fever, smallpox or phosphorus. In all cases of necrosis Nature outlines a certain territory for exfoliation, but there is no positive way to determine the size until the sequestrum has been formed. Necrosis may be seen at any stage, in a primary stage of inflammation while the sequestrum is being outlined, and again not until the last stage of exit. Periostitis, no matter from what cause, will bring about a stage of effusion between the periosteum and the bone, and separate vessels and membranes from the bone. If there is no escape of this effusion, necrosis is inevitable, and death of bone is assured. The symptoms are generally pain with pyrexia, much effusion, pus serum or sero-sanguineous fluid flowing sometimes from a number of openings through the diseased bone if a large portion is involved.

Perhaps syphilis or struma are the chief causes of necrosis found in the maxillae, and the hardest to dispose of, these being very progressive diseases, usually reaching the worst degree. My experience has found mercury more generally responsible, periostitis getting a foothold from salivation. In an adult mercury on the periosteum is transient, unless long continued; then we have a profuse flow of saliva, mercurial foeter of the breath and later, sluffing of the gums and the alveolus and the appearing of a white membrane underneath which ulceration takes place. The teeth loosen and fall out, the entire surface sluffing away, and sometimes the entire jaw bone becomes necrosed.

Some years ago perhaps phosphorous necrosis was most common. Sometimes numbers of laborers in match factories would be stricken with necrosis about the same time. Prof. Naumann shows that the disease was

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\*Read before the Kentucky State Dental Society, 1911.

usually contracted through bad teeth, developing into a periostitis, with strong effusive exudation of pus. The gums become swollen, the pus rancid, teeth fall out and the bone soon becomes deprived of all soft tissues. General indisposition, loss of appetite, severe pain and fever resulting frequently in death, accompany this disease. However, this trouble has been lessened in the last few years by the substitution of red amorphous-phosphorus for the yellow.

We will pass over the other causes we have mentioned in this paper, and will mention only in a brief way the treatment.

#### TREATMENT

Each case, it seems, requires a different handling. It is always wise to wait for the sequestrum before trying to remove a necrosed bone. We should reserve operative measures till we feel the dead parts detached, removing, of course, all necessary irritants. Our patients should in general receive such constitutional treatment as their particular cases require, tonics and stimulants such as iron, quinine, strychnine, cod liver oil, beef extract, and plenty of out-door air and exercise; if possible, in the country. As soon as the parts are loosened, the operation should be performed, removing all dead parts. The diseased portion should be cleaned out once or twice a day, using a stimulating mouth wash, one of the best being hot salt water. With this crude review of necrosis in an incomplete and general way, I will close with report of three cases I have treated.

#### REPORT OF CASES

In July, 1902, one very hot, stormy afternoon, I was called into the country, a distance of ten miles, to see our county judge, who, I was informed, was suffering with his jaw. His wife said that his face was badly swollen and some of his teeth very loose; that his physician was with him and would remain until I could get there, that we might see the case together. I had the pleasure of being caught in a storm of rain and thunder, such as we often have at that season of the year, but I finally reached the beautiful old country home just in time to eat fried chicken, cold ham and all the other good things these fine old country families have on their table. My long drive had given me a splendid appetite, and after thoroughly satisfying its demands, the doctor and I proceeded with our examination.

We found the left superior cuspid, first and second bicuspid very loose, with a profuse flow of very rancid, dark pus, flowing from a number of openings around the teeth and through the gums just under the lip. The face was badly swollen and the left eye almost closed, temperature 103°, pulse 95. We were soon of the opinion that necrosis had invaded the jaw, so we proceeded immediately to try to assist Nature in overcoming the trouble.



First we removed the loose teeth, then we syringed out the pus openings with warm salt water, painted the gums with tincture of iodine, and gave him a bottle of borolyptol to use in rinsing out the mouth. We found the judge to be suffering from constipation, so we prescribed 10 grains of calomel, to be followed the next morning with the usual dose of salts. Also, he was to take two grains of quinine every two hours. Then we left the judge, wishing him a pleasant night's sleep and an early rising the next morning. We learned later that our wish was gratified, especially the early rising.

After spending two days in bed, the judge was able to come to my office. The swelling had almost subsided, he had no temperature and his pulse was normal, but a quantity of pus was flowing from the necrosed portion of his jaw. I passed a probe into the channels through which the pus flowed, and could easily detect the affected part of the bone, but could not pull away any portion of the sequestrum, as exfoliation had not yet separated the dead bone from the living.

I continued to treat the judge every day, each time cleaning out the pus as thoroughly as I could, and trying to pull away the sequestrum. On the 10th day I was rewarded by this portion of the jaw bone—which I show you—coming away with only a very slight pull with a hoe excavator.

Two days later the judge again visited my office, and an examination soon showed a very marked improvement. Again I explored the diseased portion of the jaw, and found this piece of bone, which you see is much smaller than the first piece, ready and easy to remove. I then cleaned out the cavity in the jaw, caused by the removal of these pieces of bone, painted it with a solution of sulphuric acid and dismissed the judge for three days. On his return, there was no pus and almost a completely healed jaw.

This was a case of traumatism. About eight years previously the judge was riding over his farm on a spirited saddle horse, when a rabbit jumped up in the path and the horse, through fright, stopped suddenly, throwing the judge forward and causing his cheek to strike the horse's head with a hard blow. For some time afterwards the judge suffered with his jaw, but finally the trouble was apparently gone and remained quiet for eight years.

The next case of necrosis I shall report was that of a negro woman, of the cause for which I could find no history. She was about 40 years old, and when she came to me, all she had to say was that she had a very sore mouth, and that she had been under treatment for it, first by a dentist, but at that time she was in the hands of our local physicians. On examination I found that all the upper teeth had been removed, the upper jaw showing only a slightly necrosed condition. A few of the lower teeth had also been taken out and the alveolus and upper portion of the lower jaw bone between third molar and cuspid on the right, were badly necrosed, the remaining teeth being very loose, and a dark, rancid pus flowing freely

from the bone. There seemed to be only one thing to do and that was to remove all possible irritants; so after a consultation with the physician, we arranged to give her chloroform the following day, when we removed the teeth and scraped the bone, thus trying to give Nature a chance to restore quickly.

For a few days it seemed we would be rewarded. Very little pus could be found; but in about five days the trouble seemed to start afresh. The pus began to flow freely and continuously, coming apparently from deep down in the bone. The physician said no use to hope for recovery, that soon she would pass to her reward. Hoping that he might be mistaken and trying to relieve this poor negro woman, I persisted in my treatment twice a day. As long as she could come this often, the amount of pus was neither so profuse nor offensive. But when she did not come for a day, one could scarcely stay in the room with her while syringing out her mouth.

Each day I would hope to pull away the diseased bone and relieve the woman. From time to time I noticed a shifting of the openings through which the pus flowed, the greatest quantity coming from the angle of the jaw.

There was absolutely no money in the case, and I grew very tired, but continued to keep up the fight. In about six months I was able to pull away this piece of bone, which you will observe came from the angle of the jaw and just beneath where the ends of the roots of the teeth had set in the bone. This was a long, hard fight, but the reward made the battle worth while and proves that if we can assist Nature, even in a small way, we will reap a rich harvest, if not of gold, at least in human kindness.

The third and last case was the result of mercury.

On December 20th, 1910, I was called to the telephone by one of our local physicians, requesting me to see a patient of his who had a sore mouth. The mercury was about ten above, and 16 inches of snow had fallen through the night. The pavements had not yet been cleared and traveling was bad. I faced the cold and snow and called to see the patient, who was an old gentleman about 55 years of age, who had been brought to Paris from Nicholasville. After some trouble in questioning the family, I learned that the doctor was treating him for kidney trouble. The patient's mind was considerably affected from the uremic poisoning, passing from a seeming complete possession of all his faculties into a condition of the wildest imaginings. With this introduction to my patient, and history of his case, I then proceeded to examine his mouth. My diagnosis in fact had already been made from the history of the case and the odor about the patient. If any of you gentlemen present have ever entered a room where some one was badly salivated, you could never mistake the odor of salivation. This was what I expected to find, combined with a periostitis due to the kidney trouble. My diagnosis was correct as far as it went, but I certainly had not expected to see such a picture as that old man's mouth, one of the most horrible sights I ever looked upon, and one I sincerely hope never to see again. The alveola and upper third of the inferior maxilla were stripped

of all gum tissues from the second bicuspid on the right to the second molar on the left. The tissues seemed to be drawn away, presenting the appearance of being rolled back, just as you would take a bed quilt, beginning at the edge, and roll it up. This drawn-away condition of the gums on the labial and buccal sides exposed the alveolus and the upper third of the maxilla. This same condition existed on the lingual sides, the gums being rolled back under the tongue. These rolls of gum tissue were hard and white. The second bicuspid on the right was still in position. The cuspid, second bicuspid, first and second molars were still in their sockets on the left. The rest of the teeth had been removed by the patient himself, he lifting them out with his fingers. My attention was then called to the superior maxillae. I found that the first molar, first and second bicuspid on the left were gone, and had left a cavity you could easily have put your finger into. The gums were here as in the lower maxilla—drawn away, white and hard, but not so extremely involved. On the right side of the superior maxilla, the first bicuspid was gone. All of these teeth had been removed by the patient himself. It was not necessary to explore with instruments to diagnose necrosis. The sequestrum could be seen with a dark putrid pus flowing from many places from the dry lifeless bone. Although I had had a number of patients with necrosis, this one looked almost too grave for me and I was tempted to let it pass to one more skilled in oral surgery than I. Not expecting this extreme condition, and especially necrosis, I was not prepared to take up the treatment at that moment. However, I cleaned off the gums with peroxide, syringing out all the pus openings I could find. Then I painted the gums with tincture of iodine and left a bottle of wash I use in treating a number of sore mouths that come under my care. I returned to my office, my mind riveted on that old man's mouth and how I would treat it, and that thought kept me busy all day. At seven o'clock the same evening the doctor and I called together to see the patient. As we entered the room, the old gentleman exclaimed, "You are the greatest men on earth, you have cured me." It was gratifying to know that cleaning out the mouth had given him some relief. The physician was hardly inclined to believe my story of our patient's mouth, though frankly admitting that he had not looked at it closely. But when he did see it, his hand shot up over his head and he exclaimed, "Horrible, horrible, Dailey! I had no idea of such a mouth as that." I had forceps with me to extract the cuspid and bicuspid on the left, as they seemed firm in their sockets. The doctor and I both tested them to see if they were loose and we both agreed that they were not, but should come out anyhow. The old gentleman said that if we wanted them out, he would do the pulling, which he did apparently with ease. My first intuition was to cut out all diseased bone possible, but I had treated several cases of necroses with carbo-sulphate with such splendid results that I decided to use carbo-sulphate with this man. I first cleaned out the pockets very thoroughly with peroxide. I pumped carbo-sulphate into the sockets where the teeth were missing, and into every pocket I could find, also using it



to paint the gums that I might say were necrosed. I then painted along the margin of the diseased gums with tincture of iodine, left the mouth wash that I have mentioned, with instructions to use every half hour, applying with cotton, covering, if possible, every part of diseased tissue. I also had the patient frequently rinse out the mouth with hot salt water. I left the care of the bowels, diet and sleep with the physician, who I was sure would do his part well. This patient had a temperature for about ten days. I called twice each day, and continued the treatment as stated above, the results of which were most gratifying all along. On three occasions we had a septic condition to fight, this being caused by the patient digging into his gums with his finger nails. This brought his fever to 102 degrees. The surroundings for taking care of a patient so ill were crude and on many occasions repulsive. Sons-in-law I frequently found drunk lying on the floor of the same room, trying to vomit in the slop jar, but succeeding badly. It was impossible to get the diet and the care the patient required. The kidney trouble and mental condition continued about the same, but with all these complications of diseases and filthy surroundings, the mouth is well and results are more than we could have hoped for.

During the last fall and winter I have treated six or seven cases of necrosis, in each instance using carbo-sulphate with the most satisfactory results. I believe that with the use of it we can soon dissolve, as it were, dead bone, so that no sequestrum whatever will need pulling away; that it greatly assists Nature in coming to the rescue, and that with greater force and rapidity necrosis will be overcome.

#### ABSTRACT OF DISCUSSION

DR. H. B. HOLMES: When I received a program of this meeting and ascertained I was to open the discussion of this paper, I at once wrote to the essayist requesting that he mail me a copy of it. In his reply he asked me to deal as leniently as possible, adding that this was practically his maiden effort. I mention this, because after listening to so interesting, instructive and ably prepared an essay, I want the members of the Association to consider for a moment the possibilities of a writer who claims this as his maiden effort. It is also interesting and intensely gratifying to note the success which has crowned the doctor's efforts in treating these necrosed conditions.

His case with the judge recalls the old poem of Maud Muller, "For of all sad words of tongue or pen, the saddest are these what might have been," if the judge had fallen into less skillful hands than our friend Dr. Dailey.

The beginning of the essay is a statement of facts which are generally recognized and accepted in the professional and scientific world, and one cannot do otherwise than accept them as indisputable.

As to the causes of necrosis, it is either an interference with the supply of the nutritive material, blood supply, or destruction of the vital activity of cellular elements.

Necrosis arising out of the first group is caused by obstruction of vascular supply through an occlusion of arteries, veins or capillaries.

The essayist has very nicely explained why the tendency to necrosis is so much greater in the inferior maxilla, where the vascular supply is by one large arterial trunk, while in the upper jaw there is a freely anastomosing circulation.

As to the direct causes of necrosis, we might say that any influence which would directly injure or permanently destroy the vital activity of the cells, would be liable

to result in this disease, the liability largely depending upon the degree of vital energy in the cells prior to the action of the active causes of necrosis. Parts debilitated from any cause are more liable to necrosis than those which have suffered no debility. I certainly can offer no criticism as to the contents of the essay. If I were to criticise, I would be more tempted to criticise it for what it does not contain. I believe the essayist has had more experience with necrosis than the majority of dental surgeons, but the premonitory symptoms, or the initial stages, of necrosis, to my mind, are one of the things which cause us the most worry, concern and sometimes considerable embarrassment; and I am sorry the essayist has not entered more fully into the diagnostic symptoms. For it is in some respects the most troublesome stage and the one least commented on.

A few days ago I was examining a class of senior dental students; one of the questions asked was this: "How would you detect necrosis of the alveolar process and state treatment?" Not a man spoke of the initial symptom, which is usually something not unlike periodontitis. The patient sometimes suffers intense pain for several days previous to any swelling or exudation of pus. Right then is the time when we are, as the boy would term it, up against the real thing. The patient is clamoring for relief and we cannot diagnose the trouble.

As to the treatment of necrosis, the essayist suggests the use of carbo-sulphate, and it is evidently all right in his hands, because the results which he obtains have proven it so. However, what one man can use advantageously, cannot be used successfully by all men in the profession. So I want in addition to this agent to suggest the use of sulphuric acid, especially in two different forms; first, the phenol-sulphonic acid, which, as you all know, is prepared from phenol and chemically pure sulphuric acid. I do not mean to use this agent in its full strength, because sulphuric acid in dentistry is seldom used as such. I refer to the 50 per cent solution of phenol-sulphonic acid.

Not all pharmacists can prepare this, so I will give the mode of preparation: Heat 95% phenol in a test tube or evaporating dish nearly to boiling, then gradually add an equal amount of sulphuric acid, then while still hot, add as much warm distilled water as was taken of both phenol and sulphuric acid.

Another agent which I consider of great importance is aromatic sulphuric acid, which is a combination of sulphuric acid, rectified spirits and flavoring agents. These agents not only are antiseptic, but favor healthy granulation and cicatrization of tissue, the aromatic sulphuric acid especially having the power to dissolve thin particles of necrosed and carious bone.

After having removed the sequestrum and cleansed the cavity, I would recommend packing with iodoform gauze saturated with aromatic sulphuric acid.

DR. H. G. CUNNINGHAM, Cadiz, Ky.: I was thinking that it was the hardest thing in the world to discuss a paper when you agreed with everything the essayist had written. Dr. Dailey's courage in the treatment of these different cases could not be excelled, for it takes courage to make a success out of any business or profession, and along with courage we must have confidence. If we have no confidence in ourselves how should we expect our patients to have confidence in us. The first thing that I try to do is to gain the confidence of my patients. Dr. Dailey displayed his confidence in himself with the old negro; had he been lacking in faith he would have dismissed the patient when the negro said there is no use of further treatment for she is bound to die, and I believe he said the sooner the better. I would have liked to see him when Dr. Dailey met him after he had perfected a permanent cure.

In my practice, which is in a very small town, I have had but few cases of necrosis under my observation. I would like to mention two of them. The first was caused by tubercular osteitis, which was caused to increase its progress by the extraction of the third molar adjoining the diseased part of the bone. There was a physician in this case, too; however, he was the patient, who had been suffering with lung trouble

for some time when he presented himself to me suffering with this tooth. I hesitated to extract this tooth at first, but he finally persuaded me to do so. After extracting I cleansed the socket as well as I possibly could with warm water, together with an antiseptic mouth wash, told him to continue the mouth wash, which he did; in a few days he returned to my office suffering a great deal with this bone tissue, so I diagnosed the case as necrosis and told him that the portion of bone tissue that was affected would have to be removed. So he went to Dr. Bryan, of Nashville, Tenn., who is considered one of the best surgeons of the south, and had the diseased tissue removed, returned to me and I continued to keep the incision made by the operation well packed with iodoform gauze, and had him use nothing but glyco-thymoline as a mouth wash. Patient's mouth is now in good condition, but he is in a very critical condition with the dreaded disease tuberculosis.

The next case, I was up against something that I never saw before and have not had occasion to see since. It was caused by the wearing of an artificial denture that did not fit, the plate had worn the gum tissue away, the bone was exposed and the odor was fierce. I proceeded to treat the case in this manner: I found that the diseased portion of bone was loose; I used a local anesthetic; after that I removed the diseased tissue of bone very easily, washed the socket out with warm water (as Dr. Dailey mentioned), then used glyco-thymoline, gave the patient three treatments and had no further trouble with the case.

I fully believe that we have learned a great lesson from this paper of Dr. Dailey's, and I trust that success will continue to crown his efforts along this line, as well as all others in our beloved profession.

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## ARTIFICIAL ENAMEL\*

By William Hynes, D. D. S., Stithton, Ky.

**I**N PRESENTING this paper on Artificial Enamel, it is not my object to describe any startling results, or to note any remarkable discoveries concerning these silicate cements.

Dr. S. J. Spence, of Chattanooga, in an article written in 1906 on this material, said: "If I were writing a sermon, my text would be: 'Prove all things, hold fast to that which is good.'" When artificial enamel first attracted the attention of the dental profession some five or six years ago it was taken up and lauded by the egotist; disregarded by the fogies; and handled with the utmost precaution by the more conservative. Time has given us sufficient opportunity to prove some things concerning it, and it is my object in this paper not so much to tell what I have proven, but to invoke a discussion from the society which will give testimony as to what has been proven by the profession.

There are on the market many silicate cements, the four most important of which are Ascher's Artificial Enamel, Astral, Dr. Schonbeck's Silicate Cement, Harvard Improved. Innumerable papers have been written, hundreds of tests have been performed, both in and out of the mouth, by eminent scientists and chemists to prove the properties of these materials. Tables have been made as to the relative strength, adhesion, shrinkage, loss in weight, absorbent properties, resistance to wear and in

\*Read before the Kentucky State Dental Society, 1911.



fact almost every test that can be conceived of which would prove anything in a theoretical way. I have found, by careful comparisons of these tests, that it depends on who is doing the testing, and which cement they are boosting, as to which makes the best showing. In tests this is particularly true of Ascher's Artificial Enamel, tested by Dr. Max Kulka, of Germany, and Dr. Schonbeck's Silicate Cement, tested by C. L. Bostie, of England.

All of these exhaustive tests prove but little of a timely beneficial character to us as practitioners, for true it is "the proof of the pudding is in the eating thereof."

My experience with Ascher's Enamel, and it is this material to which I wish to confine my remarks, has covered a period of three years of conservative use and close observation as to the properties, peculiarities and possibilities of this cement, and while I have had failures, I can enumerate many successful operations in fillings that have stood for two and three years, and which are today holding the tooth in a perfect state of preservation, maintaining its bright translucent color, and giving a natural and pleasing effect to its wearer. It is beyond a doubt that every practitioner of this day has read the directions for mixing and inserting artificial enamel, and have put them into effect to the best of their understanding, and that some have discarded it as worthless in their hands, while others hold to it, pronouncing it good for some cases, and not applicable in all conditions.

Time will not permit going deep enough into this subject to enumerate all factors that might cause failure, or to state every requisite to success, but I wish to point out a few things that might be beneficial to some one.

#### APPROPRIATE CAVITIES FOR SILICATE CEMENT

The teeth in which it is indicated and where best results are obtained are the centrals, laterals and cuspids, in mesial, distal and gingival cavities, which may involve a good portion of the labial or lingual surface, but do not involve the incisal edge. Cavities should be prepared as for gold fillings with the exception of bevelled margins, containing sufficient undercuts and in such a manner that direct force into all portions of the cavity can be obtained as in the insertion of gold. In the posterior teeth never insert it into an occlusal surface cavity with a shallow or even a medium step, for the result in these cases is usually a fracture separating the portion overlying the step from the body of the filling. I do not think it possesses sufficient edge strength to be a success in morsal cavities, for gold fillings and gold inlays are preferable. In the restoration of badly broken down incisors involving the incisal edge I would suggest that this material, inlaid into the labial surface of a gold inlay, is a most efficient and artistic method of restoration.

#### MIXING

It is necessary in the mixing of this cement to have every instrument scrupulously clean. A non-metallic spatula must be used, made of bone,

ivory or agate. Metal instruments have been very effectually used in my hands in packing the material into the cavity. Metallic instruments discolor the enamel, not by any action of the acid on the metal, but by friction with the fine grit in the powder, the metal is worn into the mix, but the friction need be very slight in packing into a cavity.

#### FINISHING

The finishing must not be done with metallic instruments; celluloid strips placed between the teeth and after insertion, burnished over the filling, is a most effective method of condensing into the cavity and leaves the filling with the glossy surface.

Cocoa butter used on these strips will prevent adhesion. The rubber dam must in the majority of cases be placed before inserting the filling. Dry the cavity with alcohol and hot air. After the filling has been inserted and the margins finished as neatly as possible, comes the most critical part of the operation, namely, keeping the filling dry during a sufficient length of time to insure setting. Directions say fifteen to twenty minutes.

Well, we are in a hurry, operation is finished, patient anxious to get the rubber dam off, other patients in the reception room waiting, all impatient and time flies. We guess at fifteen minutes, which in reality was five minutes, pull off the rubber dam and all is ruined. Right here I offer a suggestion which I believe is the secret of success.

#### METHOD OF FILLING

In making your mix, when it is of a proper consistency, roll it beneath your spatula on the slab into a little roll about the size of a match and as long as the bulk of the material will permit; attach the spatula to one end and insert into the cavity from the other, and when the cavity is filled lay the excess beside your open watch on the bracket, noting the time when inserted, finish the filling as rapidly as possible with instruments and celluloid strips, wait fifteen minutes by your time-piece, and in order to test the condition of your filling, break a small amount from the piece on your bracket and put it into the mouth. You will find that it has a strong acid taste and that the surface will become soft and chalky. Why? It has not set.

Should your filling become moist at this moment it will be materially impaired.

Allow five or ten minutes longer, repeat the test and you will find an improvement, but not yet having reached a state where saliva will not affect it. Cover your filling with melted yellow bees-wax, preferable to paraffin on account of its adhesive properties, clip the rubber dam beneath the teeth, should it be an approximal cavity, and remove.

The filling if necessary may be finished with fine discs and strips just prior to doing this, but preferably at a later sitting should there be one.

In the early stage of setting heat will hasten the setting, but it is claimed by experimenters that it impairs the material.

After twenty minutes the heat evolved chemically has about subsided and the additional heat applied through the wax will not damage it. The little pieces of excess, before mentioned, if preserved, serve as an excellent shade-guide for future use.

It will be found that when the material has entirely hardened it is free from taste, and produces the sensation of a piece of china when brought in contact with the teeth, a condition which is not reached before one or two hours after the material has been mixed, depending on the consistency of the mix, temperature, and the character of the mixing fluid. That from a fresh bottle will set more quickly than that from one almost used up, and now in conclusion I will give you a few things that it is not well to do.

Don't use a metal spatula.

Don't use vaseline on instruments.

Don't prescribe a carbolic mouth wash to be used on artificial enamel fillings.

Don't attempt to insert a number of fillings with one mix.

Don't depend on adhesion to hold your fillings in.

Don't overestimate the edge strength of your material.

Don't guess at the time for your fillings to set.

Don't believe your filling "will do" if it gets wet.

Don't be discouraged with failures, and last but not least, don't underestimate the value of your operation.

#### ABSTRACT OF DISCUSSION

DR. MCFERRAN CROW, Lexington: I have had practically no experience in the use of silicate cement, but have read everything about it that came my way, and have seen it mixed by experts at different times. I have also had occasion to officiate at the funeral so to speak, of a number of attempts to make fillings of it which were failures. I find no place for it in my practice for a number of reasons. The only thing to recommend it as a filling material at all is its tooth-like color.

The essayist, in his paper, has enumerated several "don'ts" in describing the manipulation of it and says time does not permit him to name all the things one must *not* do to secure a *fair* amount of success in its use. He says further, that, owing to a lack of edge strength, the material should be confined in its use to the six upper anterior teeth, not including those cavities in which the incisal edge is involved, all of which is about what every one who writes has to say. In counting up the number of surfaces and places in which decay is likely to occur in all the teeth except the wisdom teeth, out of a possible 120 to 140, only 18 may be filled with silicate cement. Still further, counting cavities which involve the incisal edge and others which may be filled with gold without it showing, there would be 8 or 10 in which to use it. In addition, considering the per cent of failures the individual necessarily has to have in inserting the fillings, I consider the call for such a material so slight that one is not justified in its use at all. In these cases where appearance is paramount to utility, porcelain makes a better filling.



DR. EBLE said that he had used this filling material for a period of six years and his experience justified him in stating that in many respects it was a good filling material, but that he considered it a most treacherous substance, and that from close observation of the instructions as published by the manufacturers of this material, and unusual judgment as to the locality and position of the teeth where it should be used, were very essential to the successful results.

He did not think that the essayist was correct in stating that a very thorough and free spatulation of this material was necessary in mixing, as that is one of the *Don'ts* which the manufacturers advise to closely observe.

DR. J. W. JUETT followed this discussion by stating that in his opinion, after four years of its use, he thought Ascher's Artificial Enamel one of the very best materials for filling the teeth, but that its field of usefulness was more or less limited and great caution should be taken in picking out locations for its use.

DR. J. R. PIRTLE expressed himself as thinking, from observation and experience, after five years' use of this material, that it was one of the most treacherous filling materials that had ever been introduced in dentistry when in close proximity to the pulp of the teeth. That he had observed in many, many instances the pulp had died or given trouble, when the cavity was anyway deep, when this material was used. He believes that in many respects it is a most valuable material and that the cavity had better be lined with cement, when very deep, before introducing this material.

DR. B. D. RIVERS followed by stating that he desired simply to add one more thought to the suggestion which Dr. Pirtle had brought out with reference to oxyphosphate of zinc or cement, that he had very frequently noticed (as many others present probably had) the discoloration of this filling material after cavities have been carefully prepared and placed in the teeth for some time, and that he had adopted the method of lining the cavity, just previous to the insertion of the material, with a thin layer of cement, being careful not to have the cement exposed to the secretions at the margins of the cavity, but having the interior and lateral walls of the cavity so lined after this cement is crystalized, sufficient attention should be made for the proper introduction and retention of the silicate of cement, which would in the majority of instances absolutely prevent discoloration following the introduction of this material.

DR. NOEL, of Nashville, stated that he had been using this filling material for about six years, but had always observed very strictly the rules regarding its manipulation and had always restricted it to locations where it would not be exposed to too great stress in mastication. He had also noticed in many instances that much trouble from the pulp would follow the insertion of this filling when of any considerable size, and that he had been for the past few years lining the walls of the cavities, just previous to the insertion of this material, with a thin lining of ether varnish; also expressed himself as being of the opinion that the manufacturers of this material did not invariably produce the same results in their product, as the material which was being placed on the market today was much superior to that which was given the profession some years ago. He thinks that Ascher's Artificial Enamel is far superior to any of the other so-called similar silicate cements that are being placed before the profession, of which there are several different ones.

DR. E. T. BARR, of Bowling Green, stated that, with four years' experience with the material, he had learned to restrict its use to simple proximal and gingival cavities. He says that when it is used it should be used strictly according to the directions given by the manufacturers, and when used rightly, he considers it one of the best materials for filling teeth ever placed before the profession.

DR. J. W. CLARK expressed himself to the effect that there was more in the mix and manipulation of the cement than in anything else. In his opinion, the majority

of instances where the death of pulp had been the result of this material as a filling, that it was due more to the pressure that was necessarily produced by the introduction of the filling material than by any deleterious effect the material has upon the tooth structure or pulp.

DR. W. S. SMITH expressed himself, saying that the so-called "new-skin" put upon the market by many of the druggists, considered one of the home remedies at the present, had proven a most successful material with which to line the cavity when this material was used, which prevents, in many instances, the discoloration and also the deleterious influence upon the pulps.

DR. O. G. WILSON stated that he had been very much struck with the varied expressions and decisions which had been expressed by the different men who had discussed this material. He thinks the most satisfactory results from the use of this material are to be had by strict adherence to the rules as given by the manufacturers.

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## PYORRHEA: ETIOLOGY AND TREATMENT.\*

By Dr. L. C. Burgard, Louisville, Ky.,

THE Greek translation of the word "pyorrhea" means "flow of pus," and it is a term generally adopted by the dental profession for a condition that destroys the supporting tissues of a tooth or teeth, the periodontal membrane and immediate alveolar process, and if not checked in its progress, terminates with tooth exfoliation.

As to the etiology of a disease that can bring about such tissue destruction, the leading authorities on pyorrhea differ, although not as radically as they did in the past. As to its treatment by those who are actually obtaining results and not merely theorizing, there is but a slight variance of opinion.

In pyorrhea, as in many other pathological conditions that produce a disturbance of function, the primary cause is often overshadowed or entirely obliterated by the grave condition it has established. Hence the operator should at all times have some knowledge of the etiology of the respective pathological conditions he intends to treat, for very often such conditions are due to entirely different causes, and unless these initial causes are corrected, little success can be expected.

Too much stress cannot be placed upon this fact, for repeatedly patients have presented themselves to the writer for pyorrhea treatment who had been in the hands of competent dentists and been treated with little or no success because they failed to correct the initial cause.

### SCOPE OF PAPER.

It is not possible for me to go into the pathological detail as to the etiology and the treatment of many of the complications resulting from advanced pyorrhea cases, but will simply try to bring out those important points that are met with and must be corrected in the incipient pyorrhea

\*Read before the Kentucky State Dental Society, 1911.

cases, and explain how certain causes, especially the local ones, one or more of which are always present in every pyorrhea case, produce the very first *pathological pyorrhea symptom*, or *localized inflammation of the cervical tissue*.

We shall now consider the causes enumerated, how they individually can produce the initial pyorrhea symptom, inflammation.

#### PYORRHEA CAUSES

Such causes are, for convenience, divided into two classes:

FIRST—Local exciting causes: Mal-occlusion, mal-articulation, faulty contact point and insufficient approximal space, and faulty operative work.

SECOND—Predisposing constitutional causes: Excessive use of mercury in syphilis, lead poisoning and the faulty elimination of certain toxic products which seem to have a special selective action upon the alveolar process.

These causes, whether of local or constitutional nature, will, owing to their mechanical, chemical or bacterial nature, directly excite an inflammation of the gum tissues. This cervical gum tissue, being composed of dense white fibrous tissue, we get a chronic inflammation, due to its inelasticity and poor blood supply. We have then a loss of attachment, a pocket established, and condition exceedingly favorable for further progression, such as the deposition of septic products within such lesions. If we have an invasion by one of the pus-producing organisms, there will be a formation of pus within these pockets which, on the slightest pressure, escapes into the oral cavity. This being constantly mixed and swallowed with saliva and food, may cause serious digestive disturbances, and in conjunction with the direct absorption by way of the open blood vessels within such lesions, may result in a slow toxic poisoning of the entire system. This condition being often associated with pyorrhea leads many to think that the abnormal systemic condition produces the pyorrhea, reversing cause and effect. This is at the bottom of a great many of those erroneous conclusions that pyorrhea is caused entirely by systemic conditions.

#### DEPOSITS

We have three distinct varieties of deposits—salivary, mucoid and serumal.

SALIVARY DEPOSITS: These are a precipitate of the calcium salts of the saliva, mostly of the phosphate and carbonate of lime, and are usually termed tartar. They generally include remnants of food, epithelial cells and bacteria. These deposits produce inflammation, *mechanically* and *chemically* due to their formation and septic nature, also by virtue of affording an opportunity for the lodgment of food products which in time putrefy, forming an excellent pabulum for organic development.

MUCOID DEPOSITS: These are of a slimy, glutinous nature, most frequently found along the cervical margins, but sometimes covering the



entire tooth, giving it an unnatural shiny appearance. According to Kirk they are the precipitation of mucin or coagulation of mucus due to an acid condition of the saliva. They are generally associated with individuals who lead a very sedentary inactive life, suffering with chronic constipation due to a sluggish liver. Inflammation is produced by the *septic* nature of these substances.

**SERUMAL DEPOSITS:** These deposits are often designated as pyorrhea deposits, since they are found in the majority of pyorrhea pockets. In my opinion they are formed after the inflammation is established. As to their most plausible theoretical formation, this paper will not permit me to go into pathological detail. Briefly, where we have inflammation there is an altered cell function of that particular tissue cell. This, by a series of pathological changes, results in a calcareous cell degeneration, which calcified cell remnant manifests itself as a deposit on the root surface. After once formed, the inflammatory condition is aggravated *mechanically*, due to its hard, sharp, crystal-like nature and *chemically* due to its septic nature.

#### MAL-OCCLUSION AND MAL-ARTICULATION

Few writers seem to differentiate between the two masticating forces, occlusion and articulation. When a tooth is in proper occlusion the force exerted is in direct axis with the antagonizing tooth, or, the masticating force is so distributed over the occlusal or incisal plane as not to throw any abnormal stress on the supporting tissues when the jaw is closed with a *hinge-motion*. In articulation we have the same principle to deal with except that the stress is conveyed when the jaw is closed with a *tritulating motion*. In either case, due to a faulty position of a natural tooth, mostly caused by extraction of an adjoining tooth, or the faulty construction of the cusps of a crown or bridge, or the incisal length of an anterior tooth or crown, we have present either mal-occlusion or mal-articulation. In either case the occluding tooth or teeth will become the victim of an unnatural strain which, in time, is felt by the periodontal membrane and supporting alveolar process, causing a resorption and corresponding loosening of these teeth. A tooth can be in proper occlusion yet mal-articulate due to a faulty construction of the cusps, either by the cusps being too deep to correspond with the bite of the remaining teeth, or an improper construction of the inclined planes so as not to compensate with the condyle movement. This is often termed a "locked bite." With the use of the ordinary hinge articulators there is very apt to be mal-articulation. And the reason why more of these mistakes are not recorded by a pyorrhea sequel is due to the flat cusp construction generally in vogue. In large bridges, especially where the teeth have been lost by pyorrhea, and the abutment teeth are predisposed to inflammation, such bridges ought to be constructed on anatomical articulators where the condyle path is recorded. *Few are the dentists who realize the havoc brought about by mal-articulating surfaces.*

## CONTACT POINT AND INSUFFICIENT APPROXIMAL SPACE

To Prof. G. V. Black must the dental profession bow for having forced upon it the great importance of the point of contact, a principle involved in the construction of every filling and crown, and a principle which calls for the highest degree of operative skill, which, if not properly carried out, means trouble. In my own practice I am amazed to notice how few dentists have a correct idea of this principle, and a clear conception of the difference between the construction and function of a contact "point" and contact "surface," and the importance of well formed lingual and buccal embrasures. When these principles are neglected, food passing the contact surface is not sufficiently divided for the interdental gum tissue to divert. It then crowds down on this tissue, forces it away, and soon establishes the so-called "meat holes." This *unnatural* mechanical pressure causes inflammation in this particular locality, the retention of food products augments it, and in time it becomes *septic*. Where we have an insufficient approximal space the damage is incurred by the same principle as faulty contact point, and is due either to mal-position of a tooth, or the improper reproduction of the approximal space in a filling or crown, by its encroaching on the approximal space that ought to be free and open up to the contact point.

## FAULTY OPERATIVE WORK

Many of the causes just enumerated come under this heading, along with ill-fitting bands, crowns and fillings, along the cervical margin, causing an impingement on the soft tissues, producing inflammation from mechanical irritation.

## PREDISPOSING CONSTITUTIONAL CAUSES

It is not my intention to review the discussions that have been so valiantly waged in the past, whether or not this phase is of much importance in establishing pyorrhea conditions. Clinical observations and special study of this question has caused various conclusions as to just how much constitutional conditions are a factor in producing pyorrhea. Personally I am willing to admit that there are certain conditions which produce a general lowered vitality of the entire system, and will allow the inflammatory condition established to progress more readily, but at the same time I feel positive that such conditions, with the exception of those mentioned under constitutional causes, will never produce pyorrhea without the presence of a local exciting cause. In my past experience of pyorrhea treatment, I have cured conditions in spite of certain constitutional ailments, and this by local treatment alone, hence I am inclined to doubt the real importance of such influences. I am, however, open to conviction; it is so easy to mistake cause and effect in the study of this condition. It is

an undebatable fact that the daily absorption of pus, whether from pyorrhea or other pus conditions, has caused acute septic endocarditis, dyspepsia and neurasthenia. Since rheumatism is now recognized to be due in some cases to a direct bacterial invasion, its inception might in some cases be traced to pyorrhea.

As to the excessive use of mercury and lead poisoning, it is the duty of the dentist to collaborate with a physician, so as to correct or counteract the irritation so produced. As to the latter, which condition is only found in the greatest minority of cases, according to Hartzell the cases are hopeless. His diagnosis for such conditions is where a patient shows a large and persistent increase of urea in the daily production of urine. In those cases our best efforts will prove fruitless.

I am inclined to believe that it does play a part in some cases, and in these special cases the constitutional diathesis must be corrected, else our best efforts will not meet with the response that they should. It is self-evident that any constitutional derangement, be it syphilis, tuberculosis, nephritis, etc., which causes great diminishment in the general vitality of the individual, the gum tissues succumb very readily to these contributing local exciting irritants. Admitting this, that systemic conditions play a part in some pyorrhea cases, I do not believe that constitutional conditions alone can bring about pyorrhea, but act only indirectly as a cause of it. Hartzell's theory of endocarditis would be an exception, since it acts directly on the gum tissues. This being caused by the retention of certain toxic irritants and producing an endothelial proliferation and capillary blocking, due to the slow establishment of collateral circulation, we are apt to have tissue degeneration along the gum margins. Admitting that it is a plausible theory, the writer doubts whether this is possible in a mouth where none of the local exciting causes are present, and where the massaging effect of hard brushing has toned up the gums above normal.

#### TREATMENT

Pyorrhea treatment is of two kinds, surgical and medicinal.

**SURGICAL:** This consists of the removal of deposits, necrotic tissue and infected root surfaces. Since this has to be accomplished in rather inaccessible places and on roots that present straight, concave and convex surfaces often confined to narrow pockets, it calls for technical skill and instruments which in variety of form and effectiveness are not demanded in any other operation in dentistry. In my opinion this can not be done with the instruments heretofore commonly used, for they should be so delicate, and the cutting edge so constructed that this can be done without undue marring or furrowing the root surfaces, and without severing or even mutilating the cervical rope-like attachment, for this generally results in excessive recession, and is never reproduced like the original, causing the loss of the best protector of the underlying tissues. The pyorrhea instruments that were designed a few years ago and known as the Carr and Hartzell planers, are without doubt a most efficient and complete set.



They are constructed to cut like a plane, with a pull motion which leaves the root surfaces smooth. In them we find a variety of lengths, widths, curves and angles, so the heretofore most inaccessible surfaces can be reached with ease and the instrument kept under perfect control by the operator.

Hartzell has proven that root surfaces involved in pyorrhea pockets are pitted with thousands of openings, resembling an empty honeycomb, and which are the remaining vestige of the peridental fibre origin or attachment. These necessarily must at all times be putrescent, forming a most excellent culture bed for organic development. With the instruments just described in the hands of a skilled operator, these surfaces can be planed away to a dense healthy cementum layer, and leave the surface nearly as smooth as enamel itself. Personally I can not conceive how it is possible to obtain a healthy physiological union between normal tissue on one side and pathological on the other, unless this infected surface is removed as described. In the past, being ignorant of these facts, and not having properly designed instruments, is it not possible that this was the reason so little permanent success was attained in pyorrhea work and caused the profession to doubt the possibility of a permanent cure? Judging from the success the writer, as well as others, has had by the use of these instruments, the conclusion is but logical that they supply the missing link in pyorrhea work for permanent results. Their effectiveness can best be judged from the fact that the surgical work properly performed with these instruments, the section so treated will cease to ooze pus the moment the operation is completed.

**MEDICINAL:** After the completion of a surgical sitting the pockets are flushed out with water as hot as can be borne comfortably by the patient, and sprayed with a 3% peroxid solution which has been heated to or above body temperature, using an air force of at least 50 pounds' pressure. After this, all exposed tooth surface is polished with finely powdered pumice stone by the use of an orange wood peg or a shoe peg in the hand-porte-polisher. This surface is then swabbed with cotton saturated with 10% solution of nitrate of silver. If we have gotten rid of all infected surface no stain will appear; if not, the tooth will stain after several days' exposure to light. The only explanation for this peculiar behavior of such a nitrate of silver solution is, where there is infection it evidently absorbs some of the solution, and where it is a healthy surface there is no absorption, since the solution is washed away by the oral fluids before it has time to penetrate. An application of some astringent, stimulating remedy containing iodine is then made to the gums. This drug is most ideally indicated on such tissues, for it not only acts as an astringent, and has germicidal powers of value, but promotes leucocytosis due to its possessing positive chemotaxis powers. A good prescription is the Buckley formula:

Rx.—Potassi iodii, 3; iodi (crys), 3 jjss; zinc phenol-sulphonatis, 3jj; aqua f 3 vj; glycerini, f 3 jjss.

Sig.—Apply freely to the gums.

The mouth is then sprayed with an aqueous 5% solution of spirits of peppermint simply to leave an agreeably cool sensation.

In certain stubborn cases where the gums do not respond readily to treatment, the pocket is injected with a 25 or 50% solution of Buckley's Sulpho-phenol or Head's Tartar-solvent. These drugs should be used with caution, for excessive tissue destruction may result, due to their cauterizing nature. Also because all forms of acids produce a hypersensitive condition. Lactic acid, full strength, in the pockets, is an excellent stimulant of chronic tissue. The treating of gums is a subject in itself, and no set rule can be applied. What may give excellent results in one mouth may be ineffective in another, and what is indicated in one mouth is contra-indicated in another.

#### BRUSHING

In my opinion more can be accomplished with brushing, when it comes to hardening the gums, than the prescribing of remedies. The effectiveness of thorough, vigorous brushing, properly performed with a hard bristle brush, can not be overestimated. Here we are often seriously handicapped, for it seems as if some patients do not possess, neither can they acquire, that peculiar wrist dexterity involved in good brushing. In my own practice each patient is instructed on the correct way of brushing, and cautioned at the same time as to the injurious effect of cross-brushing, which the public is so much addicted to. Correct brushing is illustrated by the use of a brush and models, and practically, by using it in my own mouth. When a week has elapsed after such instruction the patient then gives me a "wash-bowl clinic," so I may better point out how to overcome certain difficulties. As to the use of tooth powders, pastes, washes, etc., I do not like the proprietary medicines, the cure-alls, therefore, I write prescriptions for each individual case. A good wash, especially where teeth are sensitive, is the Alkaline Antiseptic Solution (National Pharmacopœia). A good astringent wash is: Zinc-sulpho carbonate and zinc pheno-sulphate, each half dram, cinnamon water eight ounces. Both of these washes to be used *ad libitum* diluted in water. Pastes like the Buckley formula, if used in the morning, leave an oily-like surface on the teeth, and are specially indicated where patients do not brush after each meal during the day.

#### INDICATIONS FOR PULP REMOVAL

This in itself is an important question, and by some entirely overlooked or overdone. In the past there was a belief that the extirpation of the pulp would direct the entire circulation of the tooth to the tissues surrounding the teeth. This idea has been proven to be erroneous. Noyes, Brommell and others have shown that these tissues, especially the peridental membrane, are normally well supplied with blood vessels; therefore, the mere pulp removal would not materially affect the circulation. Removal, however, is indicated where the depth of the pocket has so lowered the

vitality of the pulp that death has already resulted or is inevitable. Also where the unnatural exposure produces a hyper-sensitiveness to a degree where it is painfully susceptible to thermal changes.

#### CONSTITUTIONAL TREATMENT

In those cases where we suspect a general debilitated condition in the patient, which causes a general lowered vitality, it is the plain duty of the dentist to collaborate with a physician. Frankly, I never referred but two such cases to a physician in the past three years, and am sorry to state that in those the physician's treatment did not aid matters in the least. I made urinary examinations of eight successive cases, where I had pyorrhea conditions present in many different types, especially one in which there were deep pyorrhea pockets, no serumal deposits, oozing pus and the root surfaces slick-polished. In none of these examinations did I find any abnormal condition, neither did the microscope reveal any uric acid crystals. While I am willing to admit that these constitutional conditions are irresistibly tempting to associate with pyorrhea causes, I sometimes feel as if their effect is very unimportant.

As to those constitutional causes enumerated, they must be corrected. As to the latter cause, the faulty elimination of certain toxic irritants, Hartzell associates these with all patients where there is a "large and persistent increase of urea in the daily production of urine." When he finds this to be the case he considers a cure hopeless.

Of all the constitutional treatments that ought to be efficacious, is the administration of autogenous vaccine in those long-standing cases, where tissues are chronic and ooze pus. This raises the opsonic index and so prepares the phagocytes that they more readily overcome the infected condition. But from reports gathered, even these do not give uniform results.

So, after all, where gums do not respond to local treatment, we may expect but little aid by constitutional treatment. But let us not lose sight of the fact that it is only the smallest of percentages, hardly even one in a 100, that is affected constitutionally, as above stated. Admitting this I have, nevertheless, been compelled to believe, after a constant study and clinical observation of many cases, that such constitutions are the exception and not the rule. This forces me to make the statement that I do not believe it is possible to establish a pyorrhea lesion where none of the local exciting causes are present, and mouth kept in such a condition, such as correct brushing and prophylaxis treatment, will result in. At the same time it seems entirely contrary to the laws of pathology for a person to attempt to cure pyorrhea by ignoring the local exciting causes.

#### PROGNOSIS

After what has been stated under pyorrhea causes and treatment, possibly the question uppermost in the minds of the general practitioner is, "If cured will it remain cured, and will the loose teeth become tight?"



In pyorrhea, as in any other pathological condition where we have tissue destruction, the most ideal results are obtained when the condition is in its incipency. Incipient pyorrhea can be cured and remain cured in all cases, and this by the general practitioner, if he would only give it the thought and earnest devotion he does other forms of operative work.

But I am sorry to state that my experience leads me to believe that the majority of dentists never see a pyorrhea condition until the patient calls his attention to a tooth he can "wiggle with the tongue." Some will then undertake the treatment of such a tooth, where the excessive destruction of the bony support has placed it beyond the power of man to cure, and our operator, meeting with no beneficial results, becomes discouraged and immediately forms the opinion that pyorrhea is incurable, or, that there is some magic attached to its cure, the mystery of which has not yet been divulged by the successful specialists. Nothing is more erroneous. Pyorrhea never will be cured by the simple use of a "mysterious cure-all," whether used internally or locally.

Treating pyorrhea, even in the primary stages, is not a lazy man's work, for it is one of those phases of dentistry which means thoroughness in your work, or you will be disappointed with the results. Another exasperating feature attached to it is that the cure does not rest entirely with the operator, for unless he receive the hearty co-operation of the patient his best effort will not always bring good results.

As to these loose teeth becoming tight, it all depends on the amount and kind of supporting tissue destroyed. Sometimes such looseness is caused by the inflamed condition around the teeth, then again it is due to the excessive loss of the bony support; if the latter, it is incurable, and it is erroneous to think the little remaining tissue will be of sufficient support. To splint in such teeth and try to retain them in that manner is a gross injustice to the patient. In this kind of cases we always have present a necrotic condition of the process and root apex, and before we could even expect a cure of the remaining tissues, this would have to be removed, resulting in the severing of what little normal attachment remains. There are, however, many loose teeth that can be cured and become tight, or by use of a splint, made to do efficient service. It is, however, hard to draw a diagnostic line and say which are and which are not amenable to treatment. When confronted with such a condition our statements should be made guardedly, for nothing is more disappointing to the patient and such a confidence destroyer as extravagant claims made for such teeth. In all these progressed cases we must never lose sight of the fact that in a normal mouth the gum tissues surrounding the teeth come to and slightly above the enamel line and fill the entire approximal space to the contact point, so the remaining exposed surface can readily be kept clean by the patient. Where there has been such tissue destruction by pyorrhea as we find in the progressed cases, there are great approximal areas that can not be kept clean by the patient, and where some of the local exciting causes may begin their damage. This in con-

junction with the physiological fact that a part once inflamed is more susceptible to inflammation than it was originally, produces conditions favorable for the initial pathological pyorrhea symptom, a localized inflammation of these tissues. This can only be prevented by prophylaxis treatment at least once, but better twice annually.

#### FINAL PLEA

Those who have given this subject their special attention and study are sometimes confronted with facts to which no set rule can be applied. Here we have before us a person who has led an active outdoor life, a most perfect specimen of health and vitality, who has given his teeth reasonable care and attention, but they are succumbing to the ravages of pyorrhea. And here we have a person who lives a sedentary, inactive life, with a tubercular history, anemic and dissipated, whose mouth shows unmistakable signs of neglect, but save for a slight gingival irritation there is not the least pyorrhea symptom. And again we have patients where with our past experience to guide us with a technique of the special root surgery gained only after hours of tedious application, we see almost hopeless pyorrhea cases "melt away as the morning dew before the mid-day sun," and the gums respond to treatment as though they had been touched by the hands of magic. And then again we have a patient where, with our utmost endeavors, in conjunction with our medical knowledge, it seems as though our treatment is but palliative. In view of this I can not refrain from advancing the theory, which I do not recall ever having heard mentioned before, that in certain individuals of a predisposing history, the vital resistance in these particular gum tissues is inherently lower, regardless of the general health of the individual, and they easily fall prey to pyorrhea irritants.

If we go deeper into this subject we will find that pyorrhea is not confined to any special country or climate and is no respecter of persons, for it attacks the teeth of the poor cereal-eating natives of India as well as the well-to-do beef-eaters of our own country. It is not the result of our present civilization, for we find evidences of it in the skulls of the Egyptians. But, is it not a blot on the fair escutcheon of dentistry that we do not stimulate ourselves to a better effort in the midst of this great wave of oral hygiene which is sweeping the country, or leave it to a few isolated specialists scattered throughout this domain!

Many are the patients who have placed themselves under your sheltering wing, and you, instead of smiting the disease in its incipency, failed to recognize it and admitted your incompetency. Will you then allow it to progress until its ravenous attack has destroyed the use of these priceless gems that can never be replaced by the handiwork of man, with an edentulous mouth and excessive and unnatural destruction of process as a sequence, so that the most skilled prosthetic artisan is powerless to construct a denture that will give even seeming satisfaction? This is a serious question that you and the future must solve.

After all that has been said, preached and done, in the past and now, we never will do full justice to this fair title by which we are known in the professional world, Doctor of Dental Surgery, until each and every dental college shall have within its portals a competent instructor on this important, but most neglected phase of operative dentistry, and before this title is bestowed upon a candidate for graduation he must be able to diagnose and treat incipient cases of pyorrhea as successfully as he can insert a filling, construct a bridge, or treat an abscessed tooth. Then and not until then will we be able to smite to its vitals a disease which, together with caries and tuberculosis, is becoming a universal disease.

Pray tell me, then, why all this thought, study and attention is concentrated on tooth restoration and preservation, both in college and out, and so little towards the conservation of those vital supporting tissues, without which your beautiful edifices are best likened unto the parable of the foolish man who built his house upon the sand?

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## REPORT OF A CASE OF NECROSIS.\*

By Dr. F. R. Talley, Petersburg, Va.

THIS paper is not intended as a scientific treatise upon necrosis, nor is it the purpose of the writer to lead you to think that, according to his idea, the case was handled in a very scientific manner; but it is merely intended to show what can be done by a green man in a crude way if the effort is made when the opportunity presents itself and as a word of encouragement to any who might hesitate to tackle such a case.

The case was handled in my father's office during vacation after the writer had completed his second term at the Medical College of Virginia. The patient was about forty years old, very fine physique and rather robust. The cause of trouble was the impaction of the third molar of the inferior maxillary on the right side which made its appearance slightly

\*Read before the Virginia State Dental Society, 1911.



above the angle, and was directed in almost a straight line mesially, the grinding surface resting against the distal surface of the second molar.

I did not see the patient upon his first visit to my father's office, which was about June 1st, 1892. Upon his second visit, which was about July 1st, I was present and saw the patient and was told by my father that upon the patient's first visit, it being impossible to gain access to the third molar for the purpose of extraction, he suggested that the second molar be removed, thus allowing the offending tooth to erupt without further trouble and that he cautioned the patient that unless this was done serious trouble would, in all probability, be the result. The patient refused and left the office.

The conditions existent upon this second visit were a badly swollen cheek, sublingual and submaxillary glands extremely sore, teeth somewhat loosened and raised in their sockets, not allowing the patient to masticate his food at all. The patient was in constant pain and unable to sleep. At this time I made the suggestion that we remove the second molar and told the patient that unless this was done I was convinced necrosis would be the result. He still obstinately refused this advice and left the office. The next time I saw the patient was thirty days later, when necrosis was in full sway. He had spent three weeks in bed, attended by a physician, whose only treatment was borolyptol as a mouth wash. The physician had removed the second bicuspid and first molar with his fingers, the second and third molars had lost their sockets and were in such a condition that they could almost be removed by the same method. He had an opening on the neck just below the angle of the jaw and directly over the carotids and jugular vein, through which exfoliated bone and pus were constantly passing. He had several larger pieces of bone in a pill box which he showed me. He was much depressed and very greatly weakened by his enforced fasting and was suffering more or less from constipation. All things being considered, he was in a rather deplorable condition. I told the patient that since he had repeatedly refused the advice given him that he was responsible for his condition and that if I took his case I would assume no responsibility whatever, and he would have to consent to follow my instructions to the letter. By this time he was ready to consent to anything, and agreed to my proposition.

I first removed the second and third molars. I then washed the sockets and the fistula out with hydrogen peroxide, followed by hot water, and after making a 5% solution of sulphuric acid, injected this, using an all-glass syringe, through fistula which opened into the socket of the second molar. I then packed the fistula with iodiform gauze to prevent its closing and curtailing the drainage. I then directed the patient to take calomel that night, followed by salts in the morning, and dismissed him for that day.

I saw the patient every day, and after two or three visits, at which times the first treatment had been repeated, I commenced to curette the

diseased bone by passing the instruments through the opening in the neck under the periosteum; and in course of time I removed the entire outer plate of the bone from the angle of the jaw to the canine.

I repeated the dose of salts every two or three days until three doses had been taken and then kept the patient from constipation with mild purgatives during the treatment. I also gave him iron, quinine and strychnine tonic and made him stay out of doors, eat all the nourishing food he could get and after about a week or ten days, at my advice, he secured some light out-door work, from which he derived great benefit, not only from the exercise, but through his attention being directed to other subjects than himself.

As the sulphuric acid became too severe for the improving conditions, incident to the returning life in the tissues, I diluted the solution until it was fairly comfortable and proceeded with treatment as at first. After six weeks I sent the patient to the physician cured.

The experience was not all sunshine for me, I can assure you, for I was very much discouraged several times, especially after the first week had passed and no apparent results were obtained. At this juncture I came to Richmond and consulted Dr. Richard C. Walder, who was then professor of oral surgery at the Medical College of Virginia, and after he had assured me that the treatment was all right and cautioned me not to be too impatient I took on courage and did not lose heart again.

As in all other callings, the material side unfortunately has to be considered, and in this particular case the remuneration was very much the shape of a barrel hoop, or any other circular arrangement, with nothing in front or behind it. The patient was a workingman, had, he said, paid the doctor a dollar every time he came, until his money gave out and then the doctor magnanimously advised him to see a dentist.

But never mind the fee, or rather lack of it. We have had the experience, we have the information, or think we have, and when the next fellow comes along who can pay we will just jot down the figures and multiply by two.

But, laying all joking aside, I do not believe we are inclined to tackle these conditions in the mouth, which fall directly in our sphere, but instead we are wont to rely upon the surgeon to do the thing which we could sometimes, with our knowledge of dentistry, both mechanical and theoretical, handle to better advantage.

Then let our slogan be education, application, conservation. Education to know how, application to do it with all our might, and conservation to use our efforts to stop the alarming waste of teeth by the American public.

Learning, to be of much use, must have a tendency to spread itself among the common people.

*Henry Ward Beecher.*

SEPTIC ORAL CONDITIONS AND THEIR RELATIONS  
TO HEALTH.\*

By Dr. A. H. Sprinkel, Staunton, Va.

NOTWITHSTANDING that the fundamental branches of medicine have for many years been included in the curriculum of the dental student, after leaving college he is generally given to concentrating his efforts in perfecting himself in mechanical arts, so that by the time he has reached a high order of skill he has too often fallen into the class designated by Dr. Angle as "dentalized" — he has become so narrowed that his perception does not reach beyond his own restricted field of labor. But present day research is awakening us to the fact that our field of labor bears the same relationship to the alimentary canal as does the fountain to the stream, and that whatsoever pollutes the mouth poisons the alimentary tract, on the proper functions of which depends not only health itself but all enjoyment of life. The marvelous processes of repair and waste are solved in this tract of 32 feet; the domain over which we preside is the entrance — can any specialty of the healing art claim a higher calling? And for this same reason, mechanical excellence should not be our highest goal. Mechanical excellence is a necessary qualification, but our highest efficiency is dependent upon our ability to look beyond it and study the mouth and its relationship to the other organs of the body in health and disease.

The mouth, exposed to infection from the food introduced therein and also from the atmosphere and other external influences, containing the teeth with their favorable interstices and the too often still more favorable tooth cavity and calcific deposit; the gums, with margins free at neck of tooth, afford ideal bacterial incubator conditions. So long as the teeth are sound and free from deposit, the mucoid surfaces normal, the mouth possesses remarkable resistance to infection and food and drink receive practically no contamination; but such conditions are the exception rather than the rule, and we find a large proportion of oral cavities not only defective in masticating capacity, but actually infecting every mouthful of food and drink taken therein. Such conditions result in impaired digestion and mal-assimilation; and present-day research is conclusively pointing to pus absorption from the mouth as the cause of many diseases, the etiology of which has heretofore been obscure.

Dr. C. J. Grieves, in conjunction with Drs. Baer and Fayerweather of the Johns Hopkins Hospital, has recently published a report of a number of cases of joint disease in arthritics caused by absorption of pus from blind abscess, the abscess in question being so inactive as to require the

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\*Read before the Virginia State Dental Society, 1911.



most exacting test to locate it — the X-rays generally being used. The relief of joint affections on removal of abscess conditions leaves no doubt as to conclusions.

Children are especially susceptible to the poisonous influences of mouth infection, particularly at the age when the deciduous molars are loosening or carious teeth make mastication difficult, the child at this time acquiring a habit of food bolting with the train of evils incident to malnutrition and retarded development. Who has not seen the mouths of these little ones a festering mass of micro-organisms, one or more fistulous openings contributing? These children have an anaemic appearance, their tongues coated and breath fetid, and a general air of languor prevails. They too often get a dose of calomel instead of having the real cause removed.

Mouth-breathing is another source of oral infection, probably more contributory than direct. In childhood it is associated with some respiratory obstacle; and when long persisted in causes the characteristic high arch, protruding upper teeth with resulting malocclusion of the teeth, which later in life, almost without exception, results in pyorrhea, and in this way mal-occlusion contributes to pus formation.

By far the most prolific source of pus in the mouth is caused by that scourge of the human mouth, pyorrhea alveolaris. I believe it is contributing more to the sum total of human ailments than is dreamed of in the present stage of our enlightenment. It is remarkable that the medical profession has so long remained apathetic regarding this disease, which not only cripples the masticatory function, but literally poisons every mouthful of food that passes into the stomach. Can any amount of digestive ferment or intestinal stimulant administered by the physician counteract the slow form of toxemia that sooner or later results? And yet it is not rare to find the patient expecting relief from such treatment, doubtfully receiving the dentist's statement that he cannot hope for relief so long as such mouth conditions prevail.

Many cases of gastro-intestinal affections are directly due to the absorption of toxins from the mouth or by their conveyance to the alimentary tract through incorporation with food. All of us have had the satisfaction of seeing health return to the despairing after the clearing up of this pus-infected area, either by the extraction of the teeth involved or by that rarer accomplishment, a cure of pyorrhea without the removal of teeth. I am informed by an authority on the subject of pyorrhea that by actual test he has repeatedly reduced the amount of sugar in the urine of diabetic patients within twenty-four hours after surgical treatment of pyorrhea in the mouth of such patients, and that the relief following such treatment in other chronic and seemingly obscure diseases has often surprised him and the attending physicians.

I believe that we should deal with this disease in a more radical manner than is usually followed. We temporize too much. Doubtful teeth

should be removed at once and all other teeth which do not in a reasonable time yield to thorough removal of deposits, and if all surrounding necrotic tissues, whether periodontal membrane or alveolus, if they cannot be relieved from pus formation, should be extracted. We are endangering the health of our patients by leaving any source of pus formation, and I am just as radical concerning teeth with blind abscesses or teeth with fistulous openings which do not yield to treatment. The extraction of such teeth, when treatment fails to remove the source of infection, is not too great a price to pay to remove the cause of pus formation. Long familiarity with these conditions has bred a degree of tolerance in the dentist that is a reflection upon the profession. Particularly is this true where there is no local pain. It is just as much our duty to inform our patients of the danger to their health from any form of pus formation in the mouth as it is to fill their teeth, or to do bridgework or any other form of dental service.

It was the privilege of this writer to recently read a paper along similar lines before a medical society and the discussion that followed showed that the medical profession is awakening to the importance of the relationship of a clean mouth to good health, one member citing instances of improved efficiency in school children subject to dental inspection, and a surgeon going so far as to say that he believed there were cases of appendicitis caused by organisms from infected mouths.

The relationship of pathological organisms in the human mouth to systemic conditions emphasizes the importance of our specialty, and I feel that if I have kindled any interest in your minds I have spoken a word for the gospel of a clean mouth and a healthy body.

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### THE ORAL SURGEON.\*

By Dr. E. P. Beadles, Danville, Va.

THE MOST important factor today in the health of the nation is the oral surgeon.

We learn slowly. For generations man has been content to go on accepting the evils that befall him and, in many cases, assigning them to "Providence," thus concluding that these evils are necessary and serve some good end. We have been taught by some that only through the suffering of pain can the soul be purified; but science says not so. Pain is useful only as a warning. Science is both our religion and our hope for the future. But for science we would be living in caves and dressing in skins as did our progenitors of the savage condition. Science teaches us that the right life is the best life. Science says that an ounce of prevention is worth many pounds of cure. Science is the only thing that has ever been

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\*Read before the Virginia State Dental Society, 1911.

of any benefit to the human race. The first scientist was the inventor of the bow and arrow. This weapon gave man a certain advantage over the other animals and here the upward progress of man began.

The real study of the human body began with Galen (130-200 A. D.). He was the greatest anatomist of antiquity, and his writings remained the best on the subject until the sixteenth century. Then came Cuvier, the great French comparative anatomist. Bichat was the founder of histology, and the rise of embryology dates from the time of William Harvey and Marcello Malpighi.

These great scientists laid the foundation upon which the structure, as we know it today, rests. All honor to them. As men of science in our branch, I mean the medical branch, we must relieve human suffering; we must prevent disease. Let us never forget the motive of our high calling, for none can be higher than the relief of pain. Human suffering is the most pitiable thing on earth, and one of our specialty prevents more pain than any living man. I have no patience with the ecclesiastic who comes with a long face and says, "It is God's will." This is a slander upon the Maker of the Universe. "*Do something,*" should be our motto.

They asked Christ, "Did this man sin, or his parents, that he should be born blind?" The Jews were not far wrong in assigning all pain to some sin. We now know that what they called sin was some broken law of Nature, and pain is the penalty we must pay.

Let us come nearer home. Nearly all of our ills come from improper digestion. We now know that the brain of the insane man is just as perfect as that of the sane, but in the former some organ has gone wrong and poison is being poured into the blood, and when it reaches the brain reason is dethroned. This may be brought about in many ways. Every gland in the body must perform its function by nerve stimulation, hence if the stimulation is out of order the gland may secrete instead of eliminate poison.

Professor Henry S. Upson of the Western Reserve University has done some valuable work in connection with impacted third molars and the insane. Many cases of dementia precox have been promptly relieved by the extraction of these teeth. I will give the history of one case in the words of Dr. Upson: "A young man, twenty-one years old, as a child was unusually bright, truthful and honest. He was rather nervous, had tremors at times, and when two years old had a convulsion, but has had none since. He did well in study and deportment until he entered the high school; there he was rather mischievous, but remained throughout the course. Soon afterward, at the age of sixteen, he began to work for a business firm, and no fault was found with him by his employers, but he began to break into stores, committed robberies and finally robbed a postoffice. He was then sent to a reformatory, where he remained for two years, leaving at the age of nineteen. He then went to work in a box factory and later made collections for a firm of attorneys. He finally held up a man on the



street and was sent to the house of correction for sixty days on a technical charge of assault and battery. During all the time after he left school his actions at home were peculiar, and apparently significant of a disordered mind. There were times when he was flighty and somewhat incoherent, and in addition he had periods of automatism, during which he would respond to questions and was somewhat rigid. He had no recollection of these times. He was very peculiar in regard to his sleeping. He would throw the mattress on the floor and sleep on the springs of the bed, even in cold winter weather. In addition to his criminal acts he has always tried to right the wrongs of others. . . . Skiagraphic examination showed badly impacted wisdom teeth, abscesses at the roots of two of the lower molars, and an abscess at the end of one of the upper central incisors. The impacted and abscessed molars were extracted in January, 1909. His mental state made a gradual improvement. . . . In the latter part of May the incisor, which showed evidences of absorption, was extracted. . . . Some of the old symptoms returned, but after a week or two he began to improve and is now quiet and industrious, has good self control and gives no evidence of either mental or moral aberration." And so on through a whole book does the author give case after case where relief, almost immediately, has been attained by the extraction of impacted molars or of abscessed teeth. These have been the source of nerve irritation or of the absorption of pus into the blood.

I repeat my opening sentence, the oral surgeon is the most important factor in the health of the nation. The mouth is the beginning of the alimentary canal; it must be clean or the whole tract becomes infected. Our specialty must now be regarded as leading all the rest. We must have the best men and they must have the best training. In the past we have been much too modest. The future oral surgeon will be a regularly graduated M. D., hence his authority cannot be questioned. Many seem to think that our work begins and ends with the filling of a tooth cavity. There could be no greater error.

A surgeon friend of mine had a difficult case of necrosed lower maxillary. He sent for a surgeon of another city to do the work. When I heard of it I asked, "Why did you not invite me to see the operation?" Said he, "It did not occur to me that you would be interested."

Strange condition of affairs! Here I was a specialist of these parts and should have been the one to do the operation, and he did not know that I'd be interested!

We will come into our own some day, and all honor to the men who made the Virginia Legislature see their duty when it made the recent law requiring a better education of the men who propose to follow this specialty for a life work.

## SHALL PRESENT METHODS OF PRACTICE BE CONTINUED?\*

By Dr. H. C. Jones, Richmond, Va.

I SHALL not attempt a definite discussion of this subject since it would occupy too much of the valuable time of this Association. I shall only attempt to present, with as little detail as possible, the reason why we should not continue to follow the empirical methods which have ingrafted themselves upon our practice. These methods have been an inheritance from men whose every effort was to benefit the patient, whose labors were heavy and who worked without ceasing. When the practice of dentistry began to assume the basis which it now occupies, the causation or agency through which the necessity for the practice existed was not considered, and even to the present day is not considered as it should be. At first the reason for the practice of dentistry seemed to confine itself to the extraction of the teeth, when affected by caries, to such an extent that further retention gave continued discomfort to the patient. Extraction was resorted to and the vacancy resulting filled with a set of teeth. When I say "vacancy" I mean to say that often when the few affected teeth were extracted the tooth-puller suggested "Let's take out the balance and then I can make you a beautiful set of teeth, more beautiful than those with which Nature endowed you, and you will have no further trouble."

An advance was made in this method by the filling of such cavities or caries as were of easy access, with either gold or amalgam. Then the beautiful workers in artificial teeth soon became overshadowed by the beautiful gold-builders; and along with the gold builders were the amalgam builders, who claimed that they could preserve teeth that the gold-builders dared not attempt.

At this period all attention seemed to be centered in the high mechanical skill of these men, and the artistic efforts of the gold-builders, combined with the long hours of torture to the patient, produced beautiful results in the opinion of many. The men who were prominent in the profession at this time were, as a rule, men of strong characteristics, self-assertive, distinguished in their way; if gold-builders, gold was the one and only substance worthy to be put in the human tooth; if amalgam workers, amalgam was the only thing which would pre-eminently prevent the recurrence of caries. Both of these classes were certain that their efforts would result in permanent good.

How many of these monuments to the skill of these men were permanent? So few and far between that their work might easily be called futile, not that in many instances, and *from certain changed conditions*, caries did not recur, but was this because of the skill of either class of these workers?

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\*Read before the Virginia State Dental Society, 1911.

At the conventions then held heated discussions were had as to whether it was right to use amalgam or gold; hours were spent by these able and skilled mechanical dentists in their empirical discussions of the uses of these materials. Look over the records and you will not find a single discussion as to causation, the agency through which the condition which was treated was induced. This fact was realized a little later, but as yet the microscope had not revealed any of the hidden things which are now believed to be true, as factors in the causation of disease of the oral cavity. Let us pause for a few moments to speak of a force whose power seems to be the greatest of all causes, working to produce the conditions which confront us in the practice of our profession. What is this force? It is named vitality. Vitality as a force must always be reckoned with when we discuss effects on living organism produced by the same, or other causes; that is to say, the same cause will not always produce the same effect—whether the cause is morbidic or traumatic, varying degrees of vitality varying the effects produced by the causes; therefore, the agency through which morbidic or traumatic causes act is varied. Vitality dies with the peculiar organism of which it is a part, so far as that part is concerned; but vitality, the force unknown, unseen, unmeasured, does not die; like all other forces, it is permanent.

Vitality as a force in the human organism is impaired by various and manifold causes. The improper cleansing and nourishing of the organism in which vitality exists impairs its functions. I believe that vitality is one of the forces of Nature, co-equal with if not greater than all the other cosmic forces. The power of this force seems to me to have been overlooked, or rather possibly I should say, not considered with that degree of attention which should have been given to it in our practice. Often many of us have subjected patients whose vitality was of a low degree to the same serious and tedious operations to which we have subjected patients of a high order of vitality—have we done right in so doing?

What is the primal cause of dental caries? This is one of the questions among many others which confront the dental practitioners. Do caries occur because the teeth of the human being are not possessed as fully with the force of life as Nature intended, or is it because of something other than that which may be present in the oral cavity? There are recorded instances of carious conditions of the teeth of animals other than those which have been domesticated by man. Assuming the carious conditions to be the same, which assumption I believe to be true, these animals, living according to Nature's intent, must have been affected by something other than failure to properly use their teeth; there must have been some other condition within them to have been the cause of the carious condition of the teeth. I believe that there is vitality in all of the tooth structures as well as the softer tissues of the oral cavity. I repeat this statement as to the tooth structures. I am clearly convinced that all of the elements which enter into the structural formation of the tooth are endowed with



vital force. Nature's laws of life and methods of administering them are fixed, and for this reason I believe that all parts of living organism is subject thereto. The human organism, the highest of all creations, is so sensitively subject to these laws that the slightest violation of any of them will produce an effect on the organism. If the violation is extreme, the effect is extreme; if the violation is mild, the effect is mild; if the violation is continuous, the effect produced is continuous, lasting even after the violations. The human being violates the laws of life under the system of our modern civilization continuously; does this affect vitality? There seems to be no question to the scientific mind that such is the case; therefore, if this continued violation produces an effect which is harmful, does or does not this affect the conditions of the oral cavity? Vitality in the different temperaments varies greatly as to its force; it is strongest in the bilious and sanguinous, and in the binary combination of these two. The nervous and lymphatic are the weaker of the four basal temperaments. To the varied and complex intermingling of these temperaments we owe the many differences in the exhibition of vital force. It is eminently proper to state that in the present conditions of human life there is a condition of tooth organism which is so varied in the different individuals that we may well say there is a predisposing condition of organism to disease, which condition is varied as the conditions of life may change, raising or lowering by these changes the power of this vital force. That which is true of one portion of the oral cavity is also true of the others.

Bear in mind the fact, as has been stated, that the earlier practitioners found certain conditions existing which in their judgment demanded immediate repair; many of these men were not technically educated, in fact I might truthfully say that they were all devoid of such education. In the evolution of practice, therefore, we became the heirs of their methods, we attempted to fit their methods to the results of our researches into the conditions which produced the local manifestations with which we have had to contend. At the present time this evolution has produced a *Materia Medica*, complex, scientific and unscientific, exhibited in a more or less haphazard manner, the exhibition often being governed by the fee which may result, or to be governed by such an ethical rule as "that porcelain is the only thing which should be used in filling an incisor tooth." By this I do not mean or desire in any way to be considered as impugning the efforts used in such practice, but solely to call attention in a most positive way to a method which rests upon anything but a scientific foundation. Such method is equally deserving of the severest criticism if used in any other branch of the healing art.

Now with this brief resumé of things which have been and are, is it true that the practitioners of dentistry of the present day are following that course of practice which will best accomplish the preservation of a healthy condition in the oral cavity and thereby the prevention of disease therein? Should they, or should they not, insist that as a preliminary to

practice there should be a thorough examination to determine what pathological or abnormal conditions may be present, and what remedies should be used to overcome these conditions of the general system, and then exhibit such remedies in the oral cavity as may be necessary to repair that which has been impaired by disease, and at the same time to exhibit such treatment of general or specific conditions as shall remove causation?

A few years since Dr. S. B. Palmer, of Syracuse, N. Y., made this statement: "Dental science has been kept in the background because subjects have been discussed en masse regardless of specific conditions." This statement is as true today as it was then. Bear in mind the statement with which I opened these remarks, namely, that I do not intend this as an attempt at a finished discussion, but my endeavor is to call attention to the present methods of practice, the basis of which is not broad enough to give us the necessary diagnostic information which will enable us to practice with the full expectation of results which our patients have the right to demand at our hands. In order that we may have this information I believe that in every instance there should be a thorough examination of all phases of the physiological and pathological conditions of all patients, at least for two successive years; and with this record in hand note the results of remedies used, record them, and in a comparatively short time many of our failures in treatment will turn to successes. I am fully aware that such a course of examination will require much time and that this examination would have to be made by one eminently fitted by the very highest intelligence and skill to render the service required. I know of no reason why this method should not be followed, with the close affiliation of our profession with the medical profession, many of whose men have been trained along this line. No reason presents itself to me why the M. D. and the D. D. S. should not work together in such a manner for the good of our patients.

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### THE TEETH AND ALVEOLAR PROCESS AS POINTS OF ENTRANCE FOR THE TUBERCLE BACILLUS.\*

By Frederick B. Moorehead, A. B., D. D. S., M. D., Chicago.

**T**UBERCULOSIS is probably the most discussed problem in medical science today. The internist, surgeon, gynecologist, ophthalmologist, dermatologist, laryngologist, orthopedist and dentist—all have a common interest in the problem. The tubercle bacillus is a free lance, defying and challenging all tissues. It invades the territory of every medical specialist without apology. No one can gainsay the statement that it is

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\*Read in the Section on Stomatology, American Medical Association, of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Jour. Amer. Med. Asso.*

ubiquitous. It is looked on by the layman as man's greatest physical foe. More money, thought and skill have been contributed to conquer it than any other enemy of the physical man. All this is sufficient reason for discussing the question, even in a very limited way, and yet the mouth is probably the most serious factor in the matter of infection from this organism.

The tonsil as a gateway of invasion is fully appreciated. It has been carefully studied and discussed. Medical literature in the past five years bears eloquent testimony to the splendid work which both the specialist and internists have done in the premises. Dmochowski found tubercle bacilli in lymph-vessels of tuberculous tonsils which led to involvement of the cervical glands. Hanan, Schlenker and Krueckmann demonstrated similar results by exact pathologic-anatomic demonstrations.

While many statements have been made concerning the mouth in its relation to the tubercle bacillus, not much has been done in the way of scientific study. This statement is a more or less severe indictment of the mouth specialists. Although mechanical dentistry has made splendid progress and has contributed in splendid fashion to the weal of society, nevertheless the most serious question which the mouth specialist faces is that of disease, its recognition and treatment. Diseased conditions of the mouth must always be studied and interpreted in their relation to the whole organism. This indicates very clearly the nature of the training needed by the one who is to occupy the field of stomatology.

In a rather comprehensive study Odenthal<sup>1</sup> found that 70 per cent of all children were affected with enlarged lymphatic glands. It is a well-known fact that the lymph-glands in children are more easily irritated and involved than in adults. This is particularly true of tuberculosis of the cervical lymph-glands. The reason is obvious—the root canals render the invasion of the tubercle bacillus more likely and easy in children than in adults.

A simple statement here, concerning the cervical lymphatic glands, will be of interest and service. The body of the mouth, the submaxillary and sublingual glands and gums are drained by the vasa efferentia of the submaxillary lymph-glands. There are about a dozen of these, of various sizes, found on the inner surface of the mandible beneath the platysma. A number of small glands may be found on the lower margin and external surface of the mandible. Their vasa efferentia accompany the anterior facial vein. The relation of the roots of the teeth and alveolar process to these lymph-channels is an important consideration and concerns not only this phase but the entire field of medicine. "The superficial cervical glands are placed in the course of the external jugular vein, between the platysma and deep cervical fascia. They are most numerous at the root of the neck, in the triangular interval between the clavicle, the sternomastoid and trapezius, where they are continuous with the axillary glands. A few

1. Odenthal: *Cariöse Zähne als Eingangspforte infectiösen Materials und Ursache chronischer Lymphdrüsenanschwellungen am Halse*, Inaug. Diss., Bonn, 1897.



small glands are also found on the front and sides of the larynx. The deep cervical glands are numerous and of large size, forming an uninterrupted chain along the sheath of the carotid artery and internal jugular vein, lying by the side of the pharynx, esophagus and trachea, and extending from the base of the skull to the thorax, where they communicate with the lymphatic glands in that cavity." (Gray's Anatomy).

A route which is direct and brief in extent thus leads at once from the mouth through the tissues of the neck to the thorax. One is very apt to think of the mouth as brought into relation with the body by way of the esophagus and trachea. Here, however, in this lymphatic system is a nexus which, in many respects, from a pathologic standpoint, is more vital than that afforded by the esophagus and trachea combined, vital as they are. It is a fact familiar even to laymen, and one which I need not discuss at length, that the tubercle bacillus, along with other pathogenic micro-organisms, enters the body freely through the esophagus and trachea. Here the invading organism is confronted, under normal conditions, by a "foeman worthy of his steel," a healthy epithelium. The same organism, gaining entrance through the lymphatics, finds a much more fertile field with a limited defense.

In 978 children (between the ages of 4 and 13) examined by Odenthal, 429 had progressive caries of the teeth. Of the 429 all except 4 had cervical lymphadenitis. In 237 of the 429 the teeth were badly broken down and the glandular enlargement was more pronounced. In 79 of the cases there were other pathologic lesions which could be assigned as responsible for the lymphadenitis. In 359 cases no cause could be assigned save carious teeth. In 131 cases caries were found on one side only, and in all of these the glandular enlargement was on the same side. Pedley examined 3,145 children and found that 77.5 per cent had carious teeth with more or less pronounced cervical lymphadenitis. Ungaware examined 100 children and reports 87.2 per cent with carious teeth. Felschel examined 335 orphans in Hamburg and found carious teeth in 96.4 per cent. Reese examined 13,167 children in Thuringen and Baden and found that 79 to 99 per cent had carious teeth. The above children were between 6 and 14 years of age. Out of the 100 recruits examined by Cunningham, 96 had carious teeth.

Unfortunately the authors quoted do not give data covering the percentage of glandular enlargements, clinical or microscopic diagnosis. The figures are, nevertheless, very interesting, as they indicate the great opportunity for the tubercle bacillus to gain entrance.

Of the children with enlarged cervical glands examined by Starek<sup>2</sup> 80 per cent had carious teeth. After obtaining a careful history and making a thorough examination of each case he accepted 16 per cent of the 80 per cent as having a hereditary predisposition to tuberculosis. In 41 per cent of the 80 per cent no other cause could be assigned except

2. Starck, Hugo: Der Zusammenhang von einfachen chronischen und tuberkulösen Halsdrüschenschwellungen mit cariösen Zähnen, Beitr. z. klein. Chir., xvi.

carious teeth. The average age of the children examined was  $8\frac{1}{2}$  years. Starek made an observation which is in keeping with my own experience, namely, that the extent of the glandular involvement corresponds with the number of carious teeth, and the extent of the carious process.

Cornet demonstrated before the tenth meeting of the German Surgical Society that he could produce tuberculosis of the cervical lymph-glands by inoculating pulps of teeth through artificial cavities. In animals he got the same results by rubbing cultures of tuberculosis between the lower incisor teeth, clearly demonstrating that the bacillus may enter either by way of the pulp chamber and root canal or the alveolar process. Baumgarten fed animals on tuberculous material, and in every case produced tuberculosis of cervical lymph-glands. In all of the animals the tonsils also were affected. Morelli and Jaruntowski<sup>3</sup> have clearly demonstrated the presence of the tubercle bacillus in carious teeth of patients suffering from phthisis. In this connection Hoppe has tried to prove that the presence of the tubercle bacillus is as frequent in the carious teeth of healthy as of tuberculous subjects. He examined decayed material from thirty-one carious teeth and found the tubercle bacillus in twenty-three. These were from healthy subjects in which the decay had reached the pulp.

Israel has conclusively demonstrated the infection of cervical lymph-glands by actinomycosis through the teeth.

Ruehle reports the case of a boy with *Spitzenaffektion* of the left side. The cervical lymph-glands on the same side were extensively involved. The process began by the enlargement of a single gland beneath the first molar. He demonstrated that the gland was tuberculous, but it is not certain from the record whether he found the bacillus in the molar tooth, which was badly decayed, though one would infer that he did.

Starek reports the following interesting cases:

CASE 1.—A healthy girl of 7 complained of toothache on the left side of the lower jaw. The teeth were badly decayed. Soon after the toothache had ceased, two glands under the cuspid and first molar on the left side became enlarged. Both the cuspid and first molar were carious. The glands soon enlarged and the overlying integument became discolored. The glands were extirpated. Microscopic examination revealed tuberculosis.

CASE 2.—A girl, aged 9, fairly strong and healthy, gave a clinical history of toothache on left side followed by gradual enlargement of cervical glands. At the time of the examination, the glands were quite large and the overlying skin was red. There was a fistula under the jaw discharging a serous fluid. Two large, partly caseous lymph-glands were excised, showing a tuberculous process on microscopic examination. In this case the lower second premolar and first permanent molar were badly decayed on the affected side.

CASE 3.—A girl, aged 10 years, with no disease in the family, had large cervical lymph-glands on right side, second molar (probably six-year molar), badly broken down. The glands were extirpated. The microscope revealed a tuberculous process.

3. Zaruntowski: Ueber Tuberkulose des Zahnfleisches, Zahnärztl. Wchnbl, viii., No. 3701.

Here we have three perfectly healthy children with tuberculous heredity excluded. The tonsils and tissues of all three mouths were healthy. The teeth were badly decayed. In two of these cases he found the tubercle bacillus in the teeth, using Ziehl-Gabett's method.

Professor Ungar of Bonn reports the case of a boy 5 years of age with a badly decayed lower cuspid tooth. The gum tissue surrounding this tooth became involved in a pathologic process which was diagnosed as tuberculosis. Later on the gum tissues on the upper jaw became involved, probably by contact infection. Professor Trendelenburg extracted the teeth and carefully removed the diseased tissue together with the alveolar process. Some time later the submaxillary lymph-glands became involved and had to be removed. Later on the deep cervical lymph-glands became involved, necessitating an extensive dissection. All glands removed were tuberculous.

Zanby<sup>4</sup> has collected forty cases of tuberculosis of the alveolar process, in which he claims the bacillus gained entrance either through the pulp canals or "spaces between the teeth." He pertinently suggests that wounds following the extraction of teeth may permit the bacillus to enter, particularly in patients suffering from phthisis.

A valuable contribution to the study of the subject has been made by Cook,<sup>5</sup> who reports the following cases:

CASE 1.—Girl, aged 13. Tubercle bacillus found in twelve-year molar. No other evidence of tuberculosis.

CASE 2.—Colored boy, aged 18. Bacillus found in debris on posterior teeth. Molars badly decayed.

CASE 3.—Girl, aged 9. Tubercle bacillus found in scrapings around roots of teeth.

CASE 4.—Girl, aged 17. Tubercle bacillus found in lower second molar. Tooth extracted. Five weeks later a small nodule appeared under jaw directly beneath extracted tooth. Later other glands became involved; no operation made.

CASE 5.—Boy, aged 11 years. Badly decayed lower left first molar. Fistula opening on lower border of jaw. Bacillus found in tooth cavity and in necrotic tissue scraped from fistula.

CASE 6.—Girl, aged 11. Swelling under left lower first molar. Tooth badly decayed. Tubercle bacillus found in pulp chamber. Later on an abscess formed and tooth was removed. Numerous bacilli found in pus.

Cook reports three other similar cases.

In my own series of ten cases I shall merely mention six of them, as they differ but little from the cases recorded above. These six cases have been studied only in part, but I hope later to complete the study and report them in detail. In four cases of my series I have succeeded in making a satisfactory study.

CASE 1.—A boy of 9 years, strong and healthy. Family history negative. Two other children in the family in good health. Thorough physical examination revealed

4. Zanby: *Von Bergmann's Surgery*, i, 677.

5. Cook, G. W: *Bacterial Investigation of 220 Mouths with Special Reference to Tuberculosis*, *Dental Rev.*, 1899. xiii., 97.



no other lesion than the one to be cited. Three months previously the boy complained of toothache on the left lower jaw. The parents being poor people, he went to a drug store and purchased a tube of "toothache paste," which was used regularly for a month or more, when the trouble ceased. The little patient suffered from pain intermittently during the period. About a month after the pain subsided, the mother noticed a nodule under the lower jaw, for which she came to me for advice. The mouth was in good condition, the teeth free from caries, except the lower left six-year molar, which had a large occlusal cavity. The enlarged lymph-gland was immediately under the tooth. Its character and appearance led to an examination, which revealed the tubercle bacillus in the cavity. The pulp at this time was dead and putrescent. The tooth was at once extracted and a so-called "abscess sac" was found on the distal root. The contents of this sac were expressed on a slide, and the tubercle bacillus again discovered. After some weeks' hesitation the parents consented to an operation. A mass of six glands varying from the size of a filbert to that of an English walnut were excised. Careful microscopic examination showed a typical tuberculous process. The patient had an uneventful recovery and four months after the operation was in perfect health, with parts normal. No evidence of recurrence.

CASE 2.—Girl, aged 10. This case gives a clinical history almost identical with Case 1. The findings were the same except on the opposite side of the mouth. Family history negative. Physical diagnosis negative, barring enlarged cervical lymph-glands on right side. The child had toothache located in the lower right first molar for several weeks, which finally disappeared. This was followed by an enlargement of the glands on the same side. After several examinations we finally discovered the tubercle bacillus in the decayed molar. The tooth was extracted, and a week later the enlarged lymph-glands were dissected out. One of the glands was distinctly caseous, and a diagnosis of tuberculosis, made from the gross specimen, was confirmed by the microscope.

CASE 3.—Boy, aged 8. This case was referred to me by Dr. Maser, who had extracted the lower left first molar a few days previous, following a history of toothache. The little patient had a mass under the lower border of the mandible on the left side which was rather diffuse in character. A mass of granulated tissue filled the socket occupied by the mesial root of the extracted tooth. This was curetted and the tubercle bacillus found in the scrapings. At the bottom of the socket there was a sinus which led directly into the mass under the jaw. When the integument was incised at the time of the operation, a large broken-down lymph gland was exposed, which was accidentally ruptured by process of dissection. Beneath this were four or five smaller glands. In this, as in the other cases, there seemed to be a distinct limitation to the process, the glands involved being walled off.

CASE 4.—Married woman, aged 32. Family history and physical findings negative. Extensive enlargement of cervical lymph-glands on left side. General condition of mouth poor. Salivary deposits on teeth marked. Gums congested and sensitive. Piece of bridgework on left lower jaw, extending from first bicuspid to second molar. Roots of these teeth very loose with pus in their sockets. Apex could be reached on almost every surface with a fine probe. The bridge was removed altogether with the roots which served as abutments. The sockets were carefully curetted and examined microscopically. The tubercle bacillus was found on two different slides. The patient refused to have the glands excised, but consented to have us remove one under a local anesthetic for purpose of diagnosis. The microscope confirmed our clinical diagnosis of tuberculous lymph-glands.

In studying the tubercle bacillus one has constantly to bear in mind the ease with which mistakes may be made; the difficulties encountered, first, in finding the organism, and second, in staining it successfully; and

also the smegma and lepra bacilli, Moeller's grass bacillus, the Petri-Rabinowitsch butter bacillus and their staining characteristics. Metchnikoff, Maffucci and Lubarsch have pointed out the aberrant forms, the recognition of which constitutes still another difficulty. Starek saw some bacilli, shorter and thicker, which were contained in a peculiar white cell. In these he noticed a point at one pole which took the stain poorly. He regarded these as endogenous spores. Despite all the difficulties, however, there is an abundance of clinical material for study and observation. While the amount of work done in the premises is limited, the case has been won, and proof is at hand that the tubercle bacillus does gain entrance to the body through diseased teeth and alveolar processes, and that the cervical lymphatics are directly infected by this route. The full significance of all this will be revealed by further study. Suffice it to state in passing that when the facts are all understood an exceedingly important contribution to modern medical science will have been made.

#### ABSTRACT OF DISCUSSION

DR. JAMES E. POWERS, Providence, R. I.: In regard to the finding of tuberculous glands, there is no question in my mind that hygienic conditions are influenced by the mouth conditions, but Dr. Moorehead failed to state the physical condition of these patients. There is no question about tuberculosis being all that we believe it to be. On the other hand, we must not forget that there are many people affected with tuberculosis, which is only discovered after death. The record of autopsies shows that the majority of cases have evidence of healed tuberculous processes in their lungs.

DR. M. H. FLETCHER, Cincinnati: *Tic douloureux* has been mentioned as one of the results or as a symptom. Our surgeons assume that *tic douloureux* is central—in the Gasserian ganglion or brain; but, ten years ago, in order to bring attention to the subject and to put before the association cases which I had observed, I assumed that it was peripheral. Since then I have had a number of cases which have strengthened this hypothesis.

It is a well-known fact that diseases of the periosteum about the face or teeth, or in the accessory cavities and air-passages, produce these continuous pains. I have had a number of cases sent to me with these symptoms. These patients were examined by some of our best men, and before being operated on were sent to me for my diagnosis. I found one case in which the pain was in the zygoma and under the right eye, and was due to an exposed pulp in the first molar below. Paroxysms of pain were drawing up the face—pain coming on suddenly and lasting for an hour or two. Sometimes it would be shorter. Before I found the trouble I had removed the second molar on the right above. After it and the pulp in the lower free molar were removed, the pain disappeared completely. The patient went home and came back in a few days suffering just as much as ever. I found that the gutta-percha filling which I had inserted for temporary purposes was pressing on the gum between the teeth and forcing it down against the bone. On relieving the pressure the pain disappeared. I have given a good deal of attention to these conditions and the possibility of their being tuberculous, and that necrotic alveolitis where there are deep-seated pockets in cancellous bone and no pus is sometimes accompanied by acute pains approaching *tic douloureux*. I believe that the bones of the face, like the spine or other bones, are frequently infected by tubercle bacilli.

DR. EUGENE S. TALBOT, Chicago: More than twenty years ago I commenced the use of iodine for interstitial gingivitis, and in the treatment of that disease found the mouth cleared up beautifully, but it was not until later I understood why I was getting

such results. I know now that if we would take those patients that come to us for the first time, even for the extraction of teeth in children's mouths, if the mouths were painted with iodine for a few minutes—fifteen minutes or half an hour before—the germs in the mouth would be destroyed. The difficulty with the official preparation of iodine is that when it is mixed with alcohol it irritates the mucous membrane, which, after one or two applications, will peel off. To overcome this tendency I have compounded a preparation without the alcohol. It is necessary to use only a 10 to 15 per cent. solution. I usually in my regular practice make application when I get through the operation for the day. Every patient that comes to me gets a dose of that before he leaves the office. In cases of sepsis the tissue between the teeth and around the gums should be thoroughly saturated. If I were to perform operations on the throat, I should paint the tonsils with a preparation composed of zinc iodide, 15 parts, water 10 parts, iodine 25 parts and glycerin 50 parts. This preparation, which I have named *iodoglycerole*, is coming generally into use, for the reason that it penetrates the deeper tissues and destroys the germs embedded there.

I am confident that if the mouths of all school children were treated with *iodoglycerole* it would entirely prevent mouth infection in the public schools. I would recommend school authorities to treat the mouths of children once a week, especially when there are epidemics.

DR. V. P. BLAIR, St. Louis: Of course, we know that the tubercle does not arise in the gland, and that it does come from the points that the glands guard. There is no doubt that the tonsil is the greatest source of infection. It has been worked out in certain clinics in Chicago and Rochester, and they tell me in Rochester that 8 per cent. of the tonsils removed are tuberculous. In a certain number of cases of tuberculous glands of the neck, the tonsil does not look as if it were probably the site of infection. Of course it may be; we cannot always tell from mere inspection. Tuberculous ear infection is rather rare. A few of these cases come from the nasal tonsil. But I believe from clinical observation that a certain percentage of cases of tuberculous glands of the neck come either through a tooth or around it. This being the case, it is important for the surgeon who is operating on a tuberculous gland of the neck to have the teeth attended to. It is my custom to use an antiseptic wash every two hours. It seems to me rather doubtful, unless it were put in with the greatest care, whether a single application of iodine would reach all the spaces between and around the necks of the teeth; but if it could be made to reach every part, it would certainly be a good thing. It is not an uncommon thing to see enlarged glands in the neck, which are probably not tuberculous, subside on a nose and throat wash, which seems to indicate that washing does some good.

DR. T. W. BROPHY, Chicago: The late Dr. Senn thought iodine the most potent of all germicides. His favorite preparation was 1 per cent. iodine crystals and 1 per cent. potassium iodide with 98 per cent. of water. This he used freely, flushing the abdominal cavity, especially in case of infection. He declared that many of his patients who recovered with the use of this treatment would have been lost without it.

DR. STEWART L. MCCURDY, Pittsburg: I read a paper a few years ago in relation to the use of iodine in cases of bone infection in which I reported a hundred or more cases. I have used iodine in all cases of osteomyelitis. Three weeks ago I chiseled open a tibia having central disease, and found that the cancellous structure of the medullary canal was entirely dissolved away, and that the bone was perfectly white inside, showing that the disease had existed for a long time. After opening the canal I used a syringe with a nozzle about three inches long and injected the tincture of iodine in both directions, closed the cavity, and the patient walked out of the hospital in two weeks without any of the old pain. I could report probably fifty cases of this type. We inject everything which has pus in it with iodine. A case of a child with a tuberculous foot in which I removed the cuboid and cuneiform bones, it was immersed



in a 10 per cent. solution of iodine for two hours every day for three weeks. I have been doing this in all such cases. If desired, compound solution of iodine may be used in place of the commercial tincture of iodine.

DR. H. A. PORTS, Chicago: I think that *tic douloureux* undoubtedly may be of dental origin, and therefore peripheral, as Dr. Fletcher said. Following hemorrhage of the brain, we at times find symptoms which are identical with *tic douloureux* which are central, and all operations, either ganglionic or peripheral, have no effect on it. I have known of cases undoubtedly of peripheral origin. Then, too, I think a close diagnosis should be made between *tic* and ordinary neuralgic pains, which are peripheral. The cases which are epileptiform and extend over a number of years are known as *tic douloureux*. I should also be interested to know if his patient is cured two months from now; because many of these cases of *tic douloureux* fall into unfortunate hands and have one tooth extracted after another, get temporary but not permanent relief.

It seems to me that tuberculosis of the bones of the face as a primary disease is exceedingly rare. I doubt also whether it follows an implantation or an extension from glandular tuberculosis. I think that the only tuberculosis of the bones of the face which may be considered primary is that which we most frequently see of the zygoma. This may be explained by the rich blood-supply; it does not have a chance to become infected; the opposite condition explains the presence of tuberculosis in the epiphysis of the long bones or digits or small bones of the hands.

DR. F. B. MOOREHEAD, Chicago: In answer to Dr. Powers, I reported the physical examination of all the cases and excluded every possibility of tuberculous infection from every other source in the body. I do not believe that tuberculosis was present in any of the cases Dr. Fletcher has cited. Tuberculosis of the bones of the mouth and face is exceedingly rare, except through extension from *lupus vulgaris*. The blood and lymph supply of the parts is so great that the *tubercle bacillus* will find lodgment elsewhere, particularly in the cervical lymphatic glands.

If I have any hobby it is diagnosis. By that I mean the analysis of every element entering into the pathologic process. It is a thing which a man must train himself to do in every case which he meets. It is the crux of every problem. If a man will train himself to that sort of thing he becomes more expert as a diagnostician and clinician.

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## THE CLOSE RELATION OF THE DENTIST TO THE PHYSICIAN.\*

By B. E. Bush, M. D., Chicago

**M**ORE intimate co-operation between dentist and physician would be beneficial alike to the patient and to the profession. Dentistry is a specialty of medicine; the stomatologist, with a broad knowledge of general medicine and a particular training in his own field, is exactly on a par with the oculist, the laryngologist or the obstetrician. Thorough knowledge of the principles of medicine must underlie all successful treatment of disease, and the patient must be regarded as an individual, not a collection of separate organs, each to be treated alone. Since one region of the body cannot be isolated from the entire organism or separated in its development, nutrition, function or disease, neither can its treatment be a separate matter.

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\*Read in the Section on Stomatology, of the American Medical Association, of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Jour. Amer. Med. Asso.*

The person attempting to treat one part of the system must understand the whole, at least broadly, in order to apply general pathology and therapeutics to his particular part. With this intelligent survey of the whole field, the dentist can be a most efficient factor in the prevention of disease and in its successful treatment. A fuller appreciation of their mutual interests would bring the family physician and dentist more often together in their work.

Many cases of general asthenia, malnutrition and anemia under medical treatment are primarily due to oral causes; and not all the tonics in the pharmacopeia will suffice to cure the patient who cannot chew his food, or who is constantly swallowing bacteria and their products from conditions of oral sepsis, such as dental caries and pyorrhea. In daily practice these unfortunate patients are a trial to their physicians, who seldom accomplishes much toward permanently relieving their state of health until he examines the source and not the sequel of the symptoms, and insists on proper treatment of the mouth and teeth. The careless doctor, who hastily writes a prescription for pepsin for the dyspepsia, cascara for the constipation, or iron for the evident anemia in such a case, will be disappointed in the results of his treatment unless he goes much farther and seeks and removes the cause of the trouble. Consultation with an able dentist will often save the patient great expense and much depreciation in health, and prove the real way to recovery; whereas months of desultory medical treatment alone would bring only trifling and temporary improvement of symptoms—to the disgust alike of the patient and physician, who often part company at this stage with a feeling of mutual relief. The busy physician dismisses the matter from his mind with the thought that “there is no satisfaction in treating these chronic cases that are all run down,” while the patient either plods along on a lower level of efficiency than he should be occupying, or suffers still further from the natural development of his morbid state. After a time secondary conditions arise. Chronic nervous and mental disturbances may appear, neuralgia, insomnia and the various fatigue neuroses, leading, in neglected cases, even to a complete physical and mental breakdown.

A fair review of these cases shows that the terminal symptom-complex was rendered possible by the low vitality of the patients, that is, by anemia and malnutrition, due to a chronic indigestion caused by imperfect mastication due to faulty teeth. Therefore, the logical early treatment was dental rather than medical; and the family physician should have pointed this out. Among his many mistakes, the sins of omission are not the least important.

Still more is this true in the case of children, in whom neglect of proper dental treatment leads often to defects of growth that become irremediable. Living proofs of this are to be seen on every hand, but even yet are not receiving the attention they merit. Take for example, the numerous cases of nasal obstruction, with adenoids, enlarged tonsils, and often recurring catarrhal inflammation with or without extension to the

frontal and maxillary sinuses, or the Eustachian canal and middle ear or mastoid cells. How many physicians or general surgeons realize the advantage of co-operation with the dental surgeon in the treatment of these children? It is not enough to tell the parent to have the child's teeth attended to and his tonsils and adenoids removed. In too many instances this does not end the trouble. The narrow arch and nostrils and high palatal vault with deflected septum will maintain the habit of mouth-breathing; the pharynx and mouth will be dry and irritated; the larynx, trachea and bronchial tubes will be injured by the rapid inhalation of unwarmed, unfiltered air, and danger to the lungs may ensue. As the child attempts to overcome his mouth-breathing habit, he is obliged to breathe more slowly and less deeply than normally through his nose, and suffers from the diminished supply of oxygen. His impeded respiration requires an increased action of the voluntary respiratory muscles and leads to faulty growth of the chest wall resulting in protruding sternum and scapulae, high shoulders and spinal distortion, while his whole respiratory condition impairs his vitality and favors the onset of disease, colds, catarrh, deafness, mastoid disease, quinsy, tonsillitis, rheumatism, diphtheria, scarlet fever and tuberculosis. And this is not all. The child of this type has a narrow arch, too small to accommodate his permanent teeth. As these are erupted, the crowded teeth may give rise to much prolonged pain and nervous disturbance which the undervitalized child is ill able to bear. With his irregular teeth he cannot masticate his food properly, and again his nutrition suffers. Deprived of abundant oxygen and digestible food-supply, he becomes the easy prey of the diseases of adolescence. The remedy is plain, namely, proper combined dental, surgical and medical treatment early in the case, and continued long enough to correct the deformity.

The surgeon and the dentist may well work together in the treatment of fractures of the jaw, in which the dentist can make a splint for retaining the fragments in position until bony union occurs, much more satisfactory than the one the surgeon is likely to buy or devise for himself. Even in the surgery of the cranial vault, a closer association of surgeon and dentist would benefit the patient, the dentist's familiarity with the dental engine enabling him to cut with delicacy and precision in places where the ordinary trephine or chisel would be most unsatisfactory and hazardous. So also with the drilling of holes for nailing or wiring bony fragments in fractures of the long bones, the drill operated by the dental engine being far superior to any hand drill or to the hammer and nail which too often splinter the bone. In some orthopedic work, the dentist with his greater knowledge of mechanics and skill in the use of metals, could often help much in the adjustment of splints and appliances.

In various suppurations about the head and neck, the surgeon is often at a disadvantage without consultation with his dental confrere. Antral disease of nasal or dental origin, parotid or submaxillary abscesses, swollen or suppurating cervical lymph glands, periostitis or necrosis of the maxillae



may be due, more or less directly, to faulty dental conditions—a fact which the surgeon is apt to overlook, but which is readily apparent to the dentist. The more obscure cases of neuralgia (so-called) will sometimes require the united efforts of dentist and physician to illuminate their etiology and direct their successful treatment.

Another line in which the physician and the dentist may help each other is the giving of anesthetics. Few general surgeons are fully acquainted with the many advantages of nitrous oxid and not only omit to use it when operating themselves, but advise patients not to take it, even for dental operations. Such advice must result from a meager knowledge of its effects, and cannot be other than detrimental to the patient's interests in many operations in which anesthesia is required for but a short time. For prolonged operative work the combined use of nitrous oxid and oxygen gives a satisfactory anesthesia in most patients, especially in those with chronic bronchitis, valvular heart disease or some other contra-indications for either chloroform or ether. The ease and sleep may be prolonged by giving oxygen with the nitrous oxid and the quick awakening to consciousness, usually without nausea, render this method of anesthesia an ideal one for many dental and surgical operations, although there are certain drawbacks to its use. It is more expensive than chloroform or ether, less readily obtained away from large cities, less easily kept on hand for emergencies and less easily carried and handled, outside of the office or hospital. On account of his better training and wider experience with this anesthetic, the dentist may properly be called on to administer it for surgical operations, just as the physician is asked to give ether or chloroform for dental operations. In any operation requiring a general anesthetic, neither surgeon nor dentist should be willing to operate without the assistance of a competent anesthetizer who can take full responsibility for the patient's condition.

In conclusion, the interests of the patient would be furthered by consultation between the physician and the dentist, not only in occasional operations and in special cases of injury and deformity, but in many conditions of acute and chronic disease. An intelligent acquaintance with each other's work, a friendly understanding and mutual respect between the members of the profession is greatly to be desired.

**He who makes his work his own  
Stands out from the ruck, alone;  
Though he dig a ditch, or plan  
Streets and structures of a town,  
Pale in school, or gather tan  
Where the sun-scorched mountains frown—  
Though he has no dream of fame,  
On each task he sets his name.**

—*W. D. Nesbet.*

A decorative horizontal border featuring a repeating pattern of stylized flowers and scrolling vines. The pattern is dark, possibly black or dark brown, on a lighter background.

# EDITORIAL

## A QUARTER OF A CENTURY ON A TRIPOD.

**T**WENTY-FIVE years ago this month the writer began editorial duties on this journal, then THE OHIO STATE JOURNAL OF DENTAL SCIENCE. Behind these years have been helpful desires, high ideals and hard work.

Editors of professional journals do not rest on "flowery beds of ease," nor in the "editor's easy chair," for proverbial "editorial tripods" are supplied for their use. Perhaps this is a wise provision on the part of publishers, for no man under the influence of corn juice, rye highs or other indulgences that bring dizzy thoughts can keep his balance on one of these contraptions long enough to write three lines of an editorial. The tripod has no back, so ye editor cannot lounge or dream about his work, nor become lazy. Its seat is of oak, but comparatively comfortable after one gets hardened to it—yet it is good discipline, for an editor has to get hardened to many things.

On the other hand the tripod gives an editor an additional means of defense in that he can stand on two feet and have three more with which to kick.

A quarter of a century on a tripod. A little calloused in spots, perhaps, but still able to fight for the best and most useful in the dental world.

But in spite of all the labor and constant monthly grind entailed, there has been much pleasure connected with it. A pleasure and satisfaction in feeling that he has been doing something that is helpful to others; a pleasure in the acquaintances and friends that it has brought; a diversion from the hum-drum of daily practice, and so, having sympathetic and helpful publishers, it has been altogether more enjoyable than otherwise.

It was not, however, the intention of the editor to make this editorial a personal one, but rather to note briefly some of the many advances in dentistry during these twenty-five years of service.

In 1887 the practical use of porcelain inlays was just beginning to be recognized. At that time the few made were from pieces of porcelain, sections of artificial teeth, ground to size and shape of the cavity, and cemented to place. This same method had been suggested by Dr. Maynard in 1858, but had met with little favor. A few years later Dr. Herbst, of Bremen, advocated the use of ground glass, fused into plaster models for inlays. Later, in 1895, the matrix of gold or platinum for inlays was



*L. Bethel*





suggested and porcelain fused into it, and we had the low and high fusing bodies. Then came the more thorough introduction of the gold inlay and improved methods in its construction.

Comparatively little was done in crown and bridge work twenty-five years ago. This useful branch of dentistry has been wonderfully developed since then. In 1895 Dr. G. V. Black began his experiments with amalgams, the results of which have brought on the market alloys of as near perfection as amalgams can be made.

In 1891 Dr. G. V. Black made a valuable contribution to dentistry in presenting a series of articles on "The Management of Enamel Margins and Extension for Prevention." His ideas, put into practice, have in a way revolutionized our operative procedures.

In 1892 Dr. Ames brought out his copper cement for setting of crowns, etc., and since then cements have been so improved that they are superior to those in use a quarter of a century ago.

During the past twenty-five years therapeutic methods have been placed on a more scientific basis, local and general anesthetic methods greatly improved and pressure anesthesia introduced.

Advancement has been made in dental prosthesis.

The application of electricity to dentistry and the addition of electrical apparatus to the dentist's outfit have been a great advance.

The science of orthodontia has been greatly developed. Prophylactic methods have been more generally introduced into practice.

There has been a great improvement in office furniture and accessories.

The introduction of carborundum to replace corundum stones and disks has been advantageous.

There has been an awakening among the laity as to the benefits of oral hygiene.

Our colleges are growing better. There is a steady improvement all along the line.

We pause and ask the question, Will the next twenty-five years show as great advancement? Why not? That is the way of the world—advancement in every direction. There is an ideal, a perfection in store for us somewhere, sometime, but its attainment can be reached only by determined and earnest endeavor; so it is our duty to ourselves and to our profession to be as helpful in the further advancement of dentistry as lies within our power.

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With pleasure we avail ourselves of this opportunity to express to readers of THE DENTAL SUMMARY our recognition and appreciation of the services of Dr. Bethel during the past quarter-century.

During that period the magazine has grown until it has become one of the most important publications devoted to the interests of the dental profession and with that growth Dr. Bethel has had much to do. Needless to say that he has grown with it; otherwise we should not now

have the pleasure of congratulating him, our readers and ourselves upon the occasion of his twenty-fifth birthday in the service.

The future of the magazine may be predicted from its past. That it shall continue to advance in merit, in circulation, in importance and usefulness in the profession is the one determination that animates all in any manner connected with it; our ambition being to make it still more deserving of the title conferred upon it by its friends: "The one magazine that no dentist can afford to be without."

THE RANSOM & RANDOLPH Co., Publishers.

## OBITUARY

Mr. John Hood, founder and head of The John Hood Company, Boston, Mass., died at his home in that city, December 15, aged sixty-seven years.

Mr Hood was born at West Roxbury, Mass. and began his business career as an apprentice in the manufacture of gold-leaf under a man named Robert Kerr. Mr. John Hood's brother later bought out Mr. Kerr and the subject of this sketch was given charge of the manufacturing end of the business. About that time the demand for gold foil among dentists began to make itself felt. At that time there were very few makers of gold foil in this country, and the demand exceeded the supply.

The manufacture of gold foil was added to the business of the new concern, and very soon required its exclusive capacity. The manufacture of gold leaf was abandoned, and the whole of Mr. Hood's time and energy were devoted to the new branch.

Mr. Hood began calling upon the dentists with gold foil alone. He was so frequently asked why he could not supply other goods that he was led to add a full line of dental goods. He secured the agency for Johnson & Johnson, New York, and other lines. Later the firm of Hood & Reynolds was organized, and in 1904 the John Hood Company was established.

Mr. Hood was one of the best known as well as one of the most thoroughly informed men in the dental field. Starting in as a boy, he worked in every department and mastered every detail. He will be missed as would few men in his line of activity.

Mr. Hood leaves a widow, never having had children.

Mr. and Mrs. James Fletcher Pershing announce the marriage of their daughter, Grace Pershing Eddy, to Dr. Clare Lowry Frame, on Sunday, the twenty-fourth of December, 1911, at Crown Point, Indiana. The contracting parties announce that they will be at home after February first at the Hyde Park Hotel, Chicago. Our congratulations.

Dr. F. L. Olds, formerly connected with The Ransom & Randolph Co., as laboratory superintendent, has formed an association with Dr. Wm. H. Van Deman, 1540-1544 The Nicholas, Toledo, and will devote himself hereafter to general practice. Dr. Olds has our best wishes for his success in the practice of a profession that he loves and honors.



# NEW PUBLICATIONS

*The American Text-Book of Operative Dentistry.* Edited by Edward C. Kirk, D.D.S., Dean and Professor of Dental Pathology, Therapeutics and Materia Medica, University of Pennsylvania, Department of Dentistry. Octavo, 932 pages, with 1,015 engravings. Cloth, \$6.00 net; leather, \$7.00 net. Lea & Febiger, Philadelphia and New York, 1911.

This is the fourth edition of this popular text-book, and we might say the best. On account of the rapid advance in dentistry within the past few years the text of this work has been largely rewritten to conform to advanced knowledge in this important branch of dentistry, and is virtually a new book. In this single volume dentists have the whole of modern operative dentistry as known and practiced by the world's leaders. Like previous editions, it is written by many contributors, each subject by a man specially fitted for its thorough presentation. For instance, Human Odontography, by Dr. Alton Howard Thompson; Dental Histology, with reference to operative dentistry, by Dr. Frederick B. Noyes; Antisepsis in Dentistry, by Dr. James Truman; Technic of Cavity Preparation, by Dr. Thomas E. Weeks; Exclusion of Moisture, by Dr. Louis Jack; Filling Cavities With Foils, by Dr. Edwin T. Darby; Use of Matrix, by William Crenshaw; Plastics and Combination Fillings, by Dr. Marcus L. Ward; Restoration of Teeth by Cemented Inlays, by Dr. W. A. Capon; Treatment and Filling of Root Canals, by Otto E. Inglis; Pyorrhea Alveolaris and Discolored Teeth and Treatment, by Dr. E. C. Kirk; Extraction of Teeth, by Dr. M. H. Cryer; Local Anesthesia, by Dr. Hermann Prinz; Plantation of Teeth, by Dr. Louis Ottofy; Management of Deciduous Teeth, by Dr. Clark Goddard; Orthodontia, by Dr. E. H. Angle; Dento-Facial Orthopedia, by Dr. Calvin S. Case; Oral Prophylaxis, Separating Teeth, Dehydration, etc., by Dr. S. H. Guilford. We congratulate the editor and publishers on the results of their labors in the production of such a helpful work. It is a valuable book not only for students but general practitioners as well.

*Dental Materia Medica and Therapeutics, with Special Reference to the Rational Application of Remedial Measures to Dental Diseases.* By Hermann Prinz, D.D.S., M.D., Prof. of Materia Medica, Therapeutics and Pathology, and Director of the Research Laboratory, Washington University Dental School, St. Louis. Second Revised Edition. St. Louis: C. V. Mosby Company, Pub., 1911. Price \$3.00.

The popularity of this work has been shown in the rapid exhaustion of the first edition. The author states that it is gratifying to learn that the profession is showing a growing interest in the pharmacologic action of drugs and in their rational application. The present tendency in the application of therapeutics is to discard the stereotyped formulas and to reverse the ancient custom of "making the disease fit the remedy." The practitioner of today is discarding untrustworthy and feeble remedies and is depending more and more on those drugs whose efficacy has been established.

The remedies are treated from the standpoint of the pharmaco-therapeutist and special attention is given to those most useful in dental practice.

The popularity of the work is not confined to this country, but its merit has been recognized abroad and it is now being translated into German. It is well written and will make a useful addition to the dentist's library.

*Dental Formulary.* A Practical Guide for the Preparation of Chemical and Technical Compounds and Accessories as Used in the Office and Laboratory by the Dental Practitioner, with an Index to Oral Diseases and Their Treatment. By Hermann Prinz, M.D., D.D.S., Prof. of Materia Medica, Therapeutics and Pathology; Director of the Research Laboratory, Washington University Dental School, St. Louis, Mo. Second Edition, Revised and Rewritten. Pittsburg, Pa.: Lee S. Smith & Son Co., 1911.

The object of this work is to furnish the practitioner and student with a reliable guide of technical information as needed in the office and laboratory of a busy practice. The book, being intended to be a practical guide, all scientific theories or matters of controversy have been omitted.

The text for the new edition has been completely rewritten. Many important additions have been made, especially in regard to recent improvements in the preparation of investment compounds, impression waxes and other materials used in the construction of metallic inlays. The formulas presented are those that possess real merit and have been found worthy of an extended trial by the profession. The author says an earnest effort has been made to present the whole matter in a thoroughly up-to-date manner.

It is one of the most useful reference books of the kind that we have seen and should be in the library of every dentist.

*Applied Anatomy and Oral Surgery for Dental Students.* By Robert H. Ivy, M.D., D.D.S., Assistant Oral Surgery to the Philadelphia General Hospital; Assistant Surgeon, University of Pennsylvania Hospital. 12mo of 280 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1911. Price, Cloth, \$1.50 net.

The author states that this book is an attempt to collect in one place and in a few words the special anatomy and surgery required by the dental student. It is not intended to replace larger works on anatomy and general and oral surgery, but rather to indicate to the student the subjects that require his particular attention.

Part I deals with the anatomy of the face, jaws, and anterior portion of the neck.

Part II, *Surgery*: Abnormal conditions of the circulation, composition of blood, inflammation, contusions and wounds, surgical fever, syncope, shock, collapse, anesthesia and preparation for operation.

*Special Surgery*: Hypertrophy, tumors, syphilis, stomatitis, alveolar abscess, osteomyelitis, necrosis, actinomycosis, diseases of the maxillary sinus, diseases of the salivary glands and their ducts, diseases of the tonsils and of the lymphatic glands, injuries and diseases of the temporo-mandibular articulation, impacted teeth, malformation of the jaws, fracture, trifacial neuralgia and facial paralysis.

The text is well written and the paper, printing and binding all that could be desired.

*Dorland's American Pocket Medical Dictionary.* Edited by W. A. Newman Dorland, M. D., Editor "Dorland's American Illustrated Medical Dictionary." Seventh Edition. 32 mo of 610 pages. Philadelphia and London: W. B. Saunders Company, 1911. Flexible Leather, gold edges, \$1.00 net; thumb indexed, \$1.25 net.

One of the best and neatest pocket medical dictionaries. Many hundred new words have been added to this new edition, most of which will not be found in other works of its kind. Moreover, special attention has been given to the inclusion of terms in dentistry, nursing and veterinary medicine, thus considerably enlarging the scope of the book. The little volume is so handy and useful it ought to be in the hands of every professional man.

*The Prevention of Dental Caries.* By J. Sim Wallace, D.S.C., M.D., L.D.S., Hon. Dental Surgeon to the West End Hospital for Nervous Diseases. London: Pub. by *The Dental Record*, Alston House, Newman St. W., 1911. Price 1/6 net.

In this little book Dr. Wallace lays particular stress on dietetic habits as a causative factor in or a preventive of caries of the teeth. His ideas are not all theoretical

but obtained from many years of observation, investigation and experiment. His conclusions seem plausible, for there is no doubt but that certain foods do bring about fermentative changes that are destructive to the teeth. He writes of the prevention of conditions which predispose to dental caries, mucus and saliva in the prevention of dental caries, prevention of certain dietetic habits which tend to induce dental caries, the prevention of the exciting causes of caries, the normal self-cleansing processes, diet in infancy and childhood, reasons for insisting on the natural hygienic method of preventing dental caries, artificial means of preventing dental caries, and the dissemination of knowledge necessary for the prevention of dental caries. It is a book that every dentist should not only read but study for his own good and that of his patients generally.

*Modern Dental Materia Medica, Pharmacology and Therapeutics, Including the Practical Application of Drugs and Remedies in the Treatment of Disease.* By J. P. Buckley, Ph.G., D.D.S., Professor and Head of the Department of Materia Medica, Pharmacology and Therapeutics, and formerly Director of the Chemical Laboratories Chicago College of Dental Surgery. Third Revised Edition. Seventy-two illustrations. Philadelphia: B. Blakiston's Son Co., 1911. Price net, \$2.50.

This book is intended to include all that a dentist should know about drugs and remedies and their practical application in the treatment of disease.

The work is divided into two parts. The first is devoted to materia medica and pharmacology, with enough therapeutics to indicate clearly the uses of the various drugs and remedies and to prescription writing and its associated subjects—metrology, medical Latin and incompatibility. The second part of the book is devoted to practical dental therapeutics.

The author states that in this new edition the text has been changed slightly throughout and several new and original illustrations have been added. The greatest change has been made in the treatment of chronic alveolar abscess. Dentists in the past have placed too much dependence in drugs as a means of correcting root and bone complications and as a result many teeth thus diseased have been needlessly extracted. Therefore the surgical treatment of these complicated conditions has been considered more fully and new illustrations added to aid in both the diagnosis and treatment.

Members of the profession are so familiar with this work that it seems unnecessary to go into further details regarding its contents. The topography, press work and binding are in keeping with the many books printed by these well-known publishers.

*Practical Dental Metallurgy.* A Text and Reference Book for Students and Practitioners of Dentistry, including the Principles of Metallurgy and their Application to Dentistry; including Experiments. By Joseph Dupuy Hodgen, D. D. S. Professor of Operative Dentistry (formerly Professor of Dental Chemistry and Metallurgy), College of Dentistry, University of California. Revised by Guy S. Millberry, Professor of Metallurgy, College of Dentistry, University of California. Fourth Edition; pp. 372. Cloth, \$2.50. St. Louis: C. V. Mosby Co., St. Louis, 1911.

The contents of this volume represent results obtained and conclusions reached in the class-room and laboratory of the author during several years of daily practical experience as an instructor and possess unusual interest and helpfulness far beyond anything obtainable by mere speculation and theory, however logical. The writer disclaims any attempt at the production of an exhaustive treatise, the aim being to present the principles of the science treated of as related and applicable to the everyday needs of the dentist. Recognizing the difficulty of arousing any great degree of interest in the minds of students upon the subjects treated of by the means of lectures, it is the hope of the author that his work shall be employed as a text-book, subject to explanatory elaboration during recitation; and to this end he has sought to make it so practical that it may be taken into the laboratory and used as a manual for both practical and experimental operations. Chapters are devoted to each of the metals falling into the classification in general use in dentistry, including noble and base metals and their alloys and amalgams, together with such explanations of their properties and treatment as seem best fitted to make the book not only thorough but of such a character as to create an interest certain to lead to increased application and ultimate comprehension of this important branch of dental knowledge.



# SOCIETY ANNOUNCEMENTS

## TO THE MEMBERS OF THE OHIO STATE DENTAL SOCIETY

During 1911 all members of The Ohio State Dental Society, in good financial standing, received THE DENTAL SUMMARY, the official organ of the society, without cost to themselves, the subscriptions being paid by the society through arrangement by the Board of Directors with the publishers of THE DENTAL SUMMARY.

For the current year of 1912 the same arrangement has been made and all members in good standing are entitled to THE DENTAL SUMMARY during this year. All members who are in arrears should remit dues at once to the secretary, so that the names can be placed on the mailing list.

Schultz Bldg., Columbus, O.

F. R. Chapman, *Sec'y.*

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## RUTLAND (VT.) COUNTY DENTAL SOCIETY

On Tuesday evening, January 9th, 1912, the dentists of this vicinity met and organized the Rutland County Dental Society. Constitution, By-Laws and Code of Ethics were adopted, and the following officers were elected: President, William R. Pond; vice-president, Percy M. Williams; secretary and treasurer, Grace L. Bosworth.

The meeting was an enthusiastic one and nearly every dentist in the county has signified his intention of joining the society. Meetings will be held once a month.

This is the first County Society to be organized in Vermont, as all members of this society must be either members of the State Society or have signified their intention of joining.

The local society hopes to bring about, among other things, a wholesome interest and growth in the state organization.

Grace L. Bosworth, *Sec'y.*

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## THE SOUTHWESTERN NEBRASKA DENTAL SOCIETY

The next meeting of the Southwestern Nebraska Dental Society will be held at Alma, Nebraska, March 14th, 1912. Election of officers will be held at this time, also important matters to come before the society.

W. A. McHenry, *Sec'y.*

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## ILLINOIS STATE DENTAL SOCIETY

The forty-eighth annual meeting of the Illinois State Dental Society will be held at Springfield, May 14, 15, 16 and 17, 1912.

A. E. Converse,

Chairman Local Arrangement Committee.

J. F. F. Waltz, *Sec'y,*

Decatur.

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## MINNEAPOLIS DENTAL SOCIETY ANNUAL CLINIC

The Minneapolis Dental Society will have a two-day meeting March 22 and 23. The program for the first day will be extensive chair and table clinics and a lantern slide lecture in the evening. The second day's program will be devoted entirely to clinics by professional talent from out of the city.

An extensive manufacturers' exhibit will be held in the same hall on both days. Any further information regarding this meeting may be obtained from

O. DeForest Davis, *Sec'y.*

# THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXII

MARCH, 1912

No. 3

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The Ohio State Dental Society  
The Michigan State Dental Society  
The Indiana State Dental Society  
The Kentucky State Dental Society  
The Louisiana State Dental Society  
The West Virginia State Dental Society

The Northern Ohio Dental Society  
The Northern Indiana Dental Association  
The Eastern Indiana Dental Society  
The Southwestern Michigan Dental Society  
Odontological Society of Western Pennsylvania  
The Lake Erie Dental Society

and Several Local Dental Societies

Editorial Office: 1255 Neil Avenue, Columbus, Ohio  
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## THE RESTORATION OF FRACTURED ROOTS.

By William Cummings Fisher, D. D. S., New York City.

### I — WHERE THE CROWN IS LOST

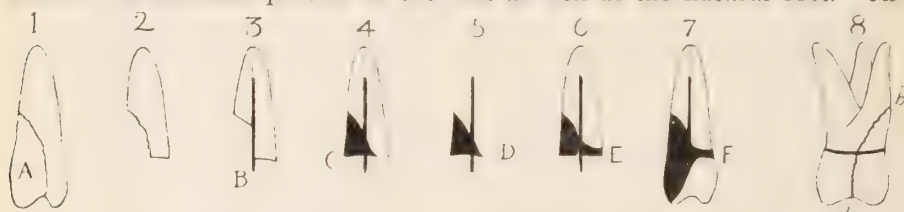
This condition (as shown in Fig. 1) is often one which causes the dentist a great amount of trouble to obtain a satisfactory result. The casting method may frequently be employed in the restoration of many roots that would otherwise be given over to the forceps.

The fractured portion A should be removed and hemorrhage controlled. Root canal slightly enlarged, and gutta percha so packed as to press the gum well away from ragged edges of root. The retention of the gutta percha will be aided by the enlarged root canal. Patient can now be dismissed and case resumed in a day or two, when the fractured edges of root will be found (Fig. 2) cleared of the gum tissue and the remaining steps taken without fear of hemorrhage, or at least not any amount which cannot be controlled by the application of a little adrenalin chloride.

A platinum iridium pin - using it as large as possible - should now be fitted to the enlarged root canal, removed, and a very little pure gold fused over the surface of that part which protrudes from the root. Fig. 3-B.

Replace pin and mould into the space from which portion of root was extracted, some inlay wax reproducing the form of root, as in Fig. 4-C. Perfect adaptation to the fractured root can be made. Remove pin with wax adhering to it and invest and cast in usual manner. The fusing of a little pure gold on pin in a previous step insures a better adhesion of the gold when cast to the platinum iridium pin. The piece now will look as in Fig. 5.

Place in root and proceed to band root as in Fig. 6. The band will encircle the artificial portion of the root as well as the natural root. The



procedure from this point is the same as the crowning of any root. The facing may be soldered to place or the casting method may be again employed to fasten the crown to the pin and band. Fig. 7.

## II — WHERE CROWN IS NOT LOST

Quite often are we confronted with fractured bicusps and molars, more often the latter, where, because of frequent fillings and perhaps faulty filling, or caries, the ordinary force of mastication will fracture the crown of the tooth, and the fracture will be continued well into the root, below the border of the alveolus. Fig. 8-ab. It is often necessary to devitalize and remove the pulps of these teeth, or perhaps treat for putrescent pulps. In these cases it is often a problem how to prevent medicaments from escaping through the fracture and irritating the soft tissues or the blood serum from seeping into the pulp canals and interfering with the establishment of aseptic conditions. I have found the employment of an ordinary clamp band (without tubes), such as is used by the orthodontist, to be a great help in saving these teeth. The band can be placed, and by gently tightening the nut the fractured parts of the tooth brought together. It is wise to take more than one sitting to do this, for the reason that the band may be found to stretch just enough to allow the fracture to open. So it should be tightened the second and third day a little. The treatment of roots can now be instituted and the fracture sealed by working a very thin mixture of cement into the ragged edges, using a smooth broach. After completion of root treatment and the apex has been sealed with chloropercha, the entire pulp chamber should be filled with cement to assist in the retention of the fracture. The clamp band may now be removed and some form of band constructed to protect the crown.



## MODERN METHODS OF PRODUCING LOCAL ANESTHESIA-\*

By Herman Prinz, M. D., D. D. S., St. Louis, Mo.

(Continued from page 96, February Dental Summary)

*The Hypodermic Armamentarium.* A hypodermic syringe that answers all dental purposes equally well is an important factor in carrying out the correct technique of the injection. The injection into the dense gum tissue requires from 15 to 50, or even more, pounds of pressure as registered by an interposed dynamometer, while in pressure anesthesia 100 or more pounds are frequently applied.

The selection of a suitable hypodermic syringe is largely a matter of choice. All-glass syringes, glass barrel syringes, and all-metal syringes are the usual types found in the depots. After testing most of the dental hypodermic syringes offered in the dental depots within the last five years by means of the pressure gauge and in clinical work, subjecting the syringes to a routine wear and tear, the author has found that the all-metal syringes of the "Imperial" type are to be preferred over other makes. They are usually made of nickel-plated brass, which, however, is a disadvantage, as the nickel readily wears off from the piston, and exposes the easily corroded brass. The Manhattan all-metal platinoid syringe gives the best general service, and we can conscientiously recommend it to our confreres. The syringe holds 40 minims (2 c. c.), is provided with a strong finger cross-bar, and is extremely simple in construction. The piston consists of a plain metal rod, without a thickened or ground piston-end or packing. The piston-rod is sufficiently long to allow about 2 inches of space between the cross-bar and the piston-top. This space is of importance, as it allows the last drop of the fluid to be expelled under heavy pressure without tiring the fingers. The packing consists of leather washers inserted at the screw point, and are quickly removed and replaced if necessary.

The hypodermic syringe requires careful attention. It is not necessary to sterilize it by boiling after each use, unless it be contaminated with blood or pus. The simple repeated washings with alcohol and careful drying is sufficient. The cap is readjusted, and the piston-rod is covered with a thin film of carbolated vaseline, or surgical lubricating jelly, and placed in position. If the syringe is boiled, all the washers must be removed. The syringe is best kept in a covered glass or metal case, and a large bacteriologic Petri dish is suitable for this purpose. Leather-lined or felt-lined boxes afford breeding places for bacteria. Some operators prefer to constantly keep their syringes in an antiseptic solution when not in use,

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\*Read before the Ohio State Dental Society, 1911.

and others prefer to place them in a special sterilizing bottle, which bottles may now be purchased at dental depots.

Dental hypodermic needles should be made preferably of seamless steel, or, better still, of nickel steel, 26 to 28 B. & S. gauge, and provided with a short razor-edge point. Thicker needles cause unnecessary pain, and thinner needles are liable to break. Iridio-platinum needles are preferred by some operators, as they may be readily sterilized in an open flame. The needle should measure from a quarter to a half inch. For infiltration anesthesia one inch needles are necessary, and curved needles of various shapes are essential in reaching the posterior parts of the mouth. The "Schimmel" needles are excellent, but do not, however, fit every syringe. For pressure anesthesia special needles are required, and may be bought at the depots, or quickly prepared by grinding off the steel needle at its point of reinforcement. The sterile needle should be kept in well-protected glass containers. The needles are sterilized after each use by boiling in plain water, dried with the hot air syringe, and immediately transferred to a covered sterile glass dish. The sterile needles should not be again touched with the fingers, and the customary wire insertion is unnecessary.

*Technique of Injection.* Various methods of injecting the anesthetic solution about the teeth are in vogue. For the sake of convenience we may be permitted to divide them as follows:

The subperiosteal injection.

The peridental injection.

The intraosseous injection.

The perineurial injection.

The injection into the pulp.

Before starting any surgical interference in the mouth, the field of operation should be thoroughly cleansed with an antiseptic solution. A thin coat of the official tincture of iodine painted over the surface is very useful for this purpose. After the diagnosis is made the method of injection best suited for the case on hand is then decided. The necessary quantity and the concentration of the anesthetic solution is now prepared, and the syringe and hypodermic needle fitted ready for the work. To facilitate the ready penetration of the needle into the tissues, its point may be coated with carbolated vaseline. The correct position of the syringe in the hands of the operator and its proper manipulation is an important factor, and has to be acquired by practice. The hand holding the syringe is exclusively governed in its movement by the wrist, so as to allow delicate and steady movements, and the fingers must be trained to a highly developed sense of touch. The syringe is filled by drawing the solution up into it; it is held perpendicularly, point up, and the piston is pushed in till the first drop appears at the needle point, which precaution prevents the injection of air into the tissue.

*The Subperiosteal Injection.* The subperiosteal injection about the root of an anterior tooth is best started by inserting the needle midway between the gingival margin and the approximate location of the apex. The pain of the first puncture may be obviated by a fine, very sharp-pointed needle, the simple compression of the gum tissue with the finger tip, by holding a pledget of cotton saturated with the prepared anesthetic solution on the gum tissue for a few moments, or by applying a very small drop of liquid phenol on the point of puncture. The needle opening faces the bone, the syringe is held in the right hand at an acute angle with the long axis of the tooth, while the left hand holds the lip and cheek out of the way. After puncturing the mucosa, a drop of the liquid is at once deposited in the tissue, and the further injection is painless. Slowly and



Fig. 3. Subperiosteal injection.

steadily the needle is forced through the gum tissue and periosteum along the alveolar bone toward the apex of the tooth, depositing the liquid under pressure close to the bone on its upward and return trip. The continuous slow moving of the needle prevents injecting into a vein. A second injection may be made by partially withdrawing the needle from the puncture and swinging the syringe anteriorly or posteriorly, as the case may be, from the first route of the injection. This latter method is especially indicated in injecting the upper molars. After removing the needle, place the finger tip over the puncture and slightly massage the injected area. A circular elevation outlines the injected field. The naturally pink color of the gum will shortly change to a white anemic hue, indicating the physiological action of the adrenalin on the circulation. No wheal should be raised by the fluid, as that would indicate superficial infiltration and consequently failure of the anesthetic.



As the liquid requires a definite length of time to pass through the bone lamina and to reach the nerves of the periodontal membrane and the pulp, from five to ten minutes should be allowed before the extraction is started. The length of time depends upon the density of the surrounding structure of the tooth. The progress of the anesthesia may be tested with a fine pointed probe, and its completeness indicates the time when the extraction should be started.

The upper eight anterior teeth usually require a labial injection only, while the molars require both a buccal and a palatine injection, using a slightly curved needle for this purpose. Buccally the injection is made midway between the mesial and distal root, and on the palatine side over the palatine root.



Fig. 4. Direction of needle in the subperiosteal injection about a cuspid.

The lower eight anterior teeth are comparatively easily reached by the injection. The straight needle is inserted near the apex of the tooth, the syringe is held in a more horizontal position, and the injection proceeds now as outlined above.

The lower molars require a buccal and lingual injection. The curved needle is inserted midway between the roots, the gum margin, and the apices. The external and internal oblique lines materially hinder the ready penetration of the injected fluid, and therefore ample time should be allowed for its absorption.

If two or more adjacent teeth are to be removed, the injection by means of infiltrating the area near the gum fold directly over the apices of the teeth is to be preferred. It is advisable to use a one inch needle for this purpose, holding the syringe in a horizontal position, so as to reach a larger field with a single injection.

The injection into inflamed tissue, into an abscess, and into phlegmonous infiltration about the teeth is to be avoided. The injection into engorged tissues is very painful; the dilated vessels quickly absorb cocaine without producing a complete anesthesia, and generally poisoning may be

the result. In purulent conditions the injection is decidedly dangerous, as it forces the injection beyond the line of demarcation. If the abscess presents a definite outline, the injection has to be made into the sound tissue surrounding the focus of infiltration. If a tooth is affected with acute diffuse or purulent pericementitis, a distal and a mesial injection

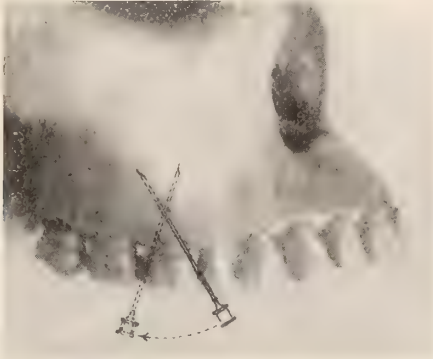


Fig. 5. Subperiosteal injection about an upper molar.

usually produce successful anesthesia by blocking the sensory nerve fibers in all directions.

*Peridental anesthesia.* Teeth or roots standing singly, or teeth affected by pyorrhea or similar chronic peridental disturbances, are frequently quickly and satisfactorily anesthetized by injecting the fluid directly into the peridental membrane. This method is known as peridental anesthesia, and its technique is very simple. In single-rooted teeth

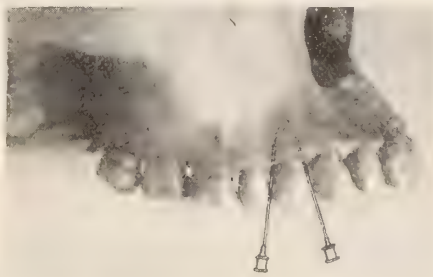


Fig. 6. Peridental injection about a bicuspid.

a fine and short hypodermic needle is inserted under the free margin of the gum, or through the interdental papilla, into the peridental membrane between the tooth and the alveolar wall. Sometimes the needle may be forced through the thin alveolar bone so as to reach the peridental membrane direct. To gain access to this membrane in teeth set close together, separation is essential. It may be accomplished with an orange wood stick or by any of the various mechanical separators. By so doing, the body of

the tooth is shifted to one side, thereby creating a slight space between it and the alveolar process. The injection is now made directly into the exposed peridental membrane. By reversing the separator, the tooth is shifted to the opposite side and the injected liquid is forced toward the apex of the tooth. A second injection is now made in this freshly exposed portion of the peridental membrane. Two, sometimes three, injections are necessary. To force the liquid into the membrane usually requires a higher pressure than that which is necessary for injecting into the periosteum covering the alveolar process, but the quantity of the anesthetic liquid is less than that which is required for the former injection. Acute inflammatory conditions of the peridental membrane and



Fig. 7. *A*, subperiosteal injection; *B*, peridental injection; *C*, intrasosseous injection about a cuspid.

its sequelae prohibit the use of this method. Peridental anesthesia is the purest form of local anesthesia, since the seat of the nerve supply of the tooth is very quickly reached, and as a consequence the results obtained are in the majority of cases extremely satisfactory, provided that general conditions justify its application. The method is especially serviceable for the removal of pulps in all such cases where contact anesthesia is not indicated or for temporarily desensitizing a tooth for operative procedures.

*Intrasosseous Injection.* To facilitate the passage of the injected fluid into the bone structure proper, Otté, in 1896, recommended a method by which he forces the anesthetic solution directly into the spongy cancelloid bone. Otté terms this procedure the intrasosseous method of injection, and its technique is described by him as follows: After the gum tissue



is thoroughly cleansed with an antiseptic solution, it is anesthetized about the neck of the tooth in the usual manner. After waiting two or three minutes, an opening is made into the gum tissue and the bone on the buccal side with a fine spear drill or a Gates-Glidden drill. The opening should be made more or less at a right angle with the long axis of the tooth, a little below the apical foramen in single-rooted teeth or between the bifurcation in the molars. The right-angle hand piece is preferably employed for this purpose. The drill should be of the same diameter as the hypodermic needle. The gum fold is tightly stretched to avoid laceration from the rapidly revolving drill. As soon as the alveolar process is



Fig. 8. Perineural injection about the upper molars.

penetrated, a peculiar sensation conveyed to the guiding hand indicates that the alveolus proper is reached, and the sensation felt by the hand is about the same as that experienced when a bur enters into the pulp chamber. In this artificial canal the close-fitting curved needle of the hypodermic syringe is now inserted, and the injection is made in the ordinary way. The quantity of fluid used is much less than is usually needed for a subperiosteal injection. The roots of the teeth are imbedded in a sieve-like mass of bone tissue (diploe), which allows a ready penetration of fluid when injected under pressure. Very recently, Masselink advocates this method for the anesthetization of any tooth in the mouth either for the purpose of extraction or the removal of its pulp. He employs a No.  $\frac{1}{2}$  round bur for penetrating the alveolar plate and a very

short needle (about one-sixteenth of an inch) with a dull point for the injection.

*Perineurial Injection.* For the anesthetization of a number of teeth in the upper or lower jaw, conductive anesthesia by means of perineurial injection is preferably employed. The perineurial injection is made near the point of exit or entrance of the various nerves about their respective foramina. To anesthetize all the teeth of one-half of the upper jaw four injections are necessary, i. e., two buccally and two on the palatine side of the bone. A one-inch needle is required for such work. To reach the many small branches of the posterior dental nerves at the alveolar foramina, the injection is made buccally over the region of the tuberosity about one-half inch above the gingival line between the first and second molar tooth. The second injection is made below the infraorbital foramen,

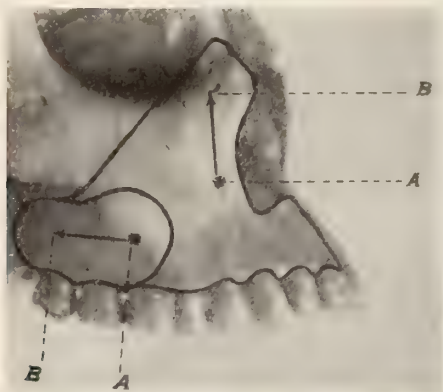


Fig. 9. Perineurial injection about the infraorbital foramen and the alveolar foramina.

so as to reach the middle and anterior dental nerves. With the index finger of the left hand the foramen is approximately located by exerting pressure upon the nerve-exit. The lip is lifted up with the middle finger of the same hand and the needle is now inserted between the apices of the cuspid and first bicuspid teeth. The needle is slowly pushed forward until its point is felt beneath the finger tip. To reach the nerve supply of the hard palate one injection is made near the posterior palatine canal, and the other near the foramen of Scarpa. The great palatine nerves pass through the posterior palatine canals on either side of the hard palate. The canals lie about three-eighths of an inch above the edge of the alveolar process and the last molar tooth. They move posteriorly with the eruption of the successive teeth. The naso-palatine nerves pass through the foramina of Scarpa (incisive foramen), which are situated in the line of the suture of the maxillary bones. If an imaginary line is drawn from the distal borders of the two cuspids and passed over the hard palate, the line will ordinarily pass through the foramina. The needle should be inserted directly back of the papilla, which lies posteriorly between the central incisor teeth.

To anesthetize one-half of the mandible, three injections for the deposition of the anesthetic solution are necessary. The first injection is applied near the mandibular foramina, the second near the mental foramen, and the third into the incisive fossa. To locate the mandibular foramen in the mouth, the lingual surface of the ramus is palpated with the finger, the anterior sharp border of the coronoid process is easily felt about five-eighths of an inch posterior of the third molar. The process passes downward and backward of the third molar, and enters into the external oblique line. Mesially from this ridge is to be found a small triangular concave plateau, which is facing downward and outward, being bound mesially by a distinct bony ridge and covered with a mucous membrane. As there is no anatomical

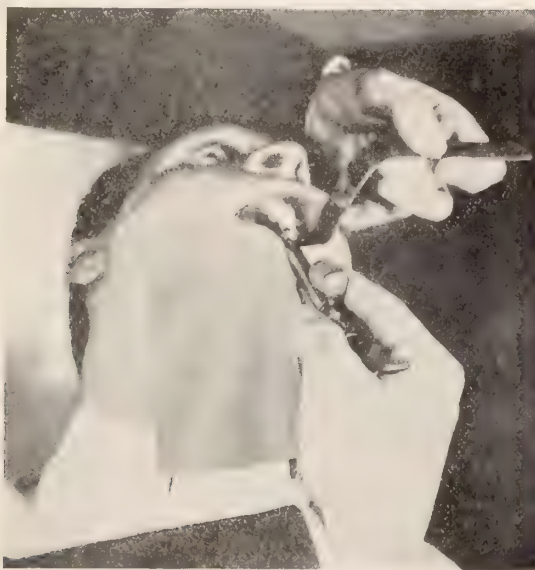


Fig. 10. Perineural injection into the palate.

name attached to this space, Braun has called it the retromolar triangle (*trigonum retromolare*). In the closed mouth it is located at the side of the upper third molar, and in the open mouth it is found midway between the upper and lower teeth. Immediately in back of the mesial border of this triangle, directly beneath the mucous membrane, lies the lingual nerve, and about three-eighths of an inch farther back the mandibular nerve is to be found. This last nerve lies close to the bone, and enters into the mandibular foramen, which is partially covered by the mandibular spine.

Before starting the injection the patient should be cautioned to rest his head quietly on the headrest of the chair, as any sudden movement or interference with the hand of the operator may be the cause of breaking the needle in the tissue. The syringe, provided with a one inch needle, is held in a horizontal position, resting on the occluding surfaces of the teeth from the cuspid backward and slightly toward the median line. The needle



is to be inserted three-eighths of an inch above and the same distance back of the occluding surface of the third lower molar, the needle opening facing the bone. This position will insure the correct direction of the needle point so as to reach the tissues immediately surrounding the nerves, and not lose the injection in the adjacent thick muscle tissue. The needle must always be in close touch with the bone, and is now slowly pushed forward, depositing a few drops of fluid on its way until the ridge is reached. About

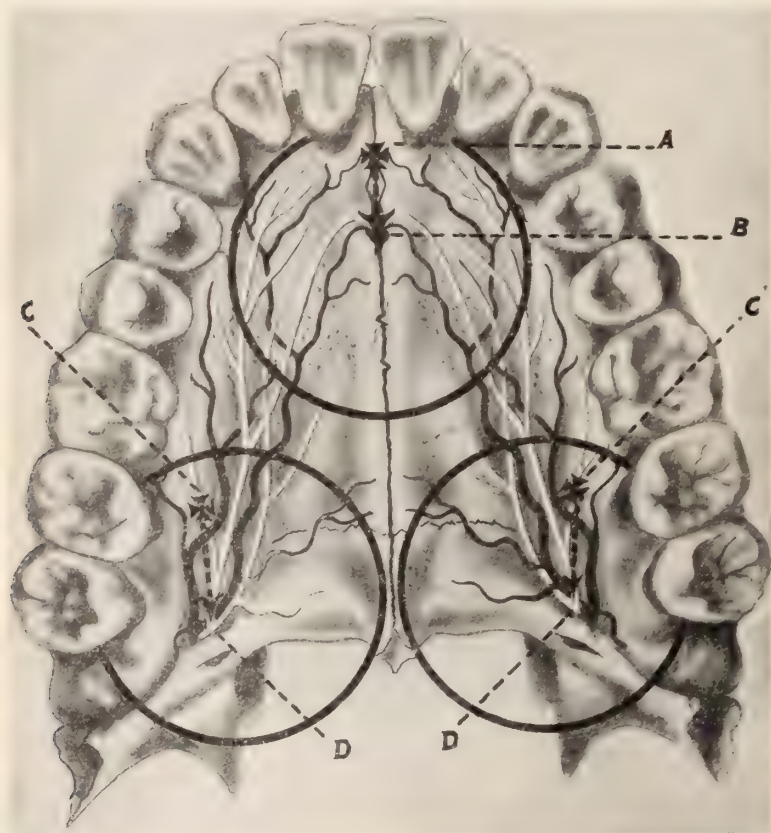


Fig. 11. Perineural injection about the foramen of Scarpa and about the posterior palatine canal.

five drops of fluid are injected in this immediate neighborhood for the purpose of anesthetizing the lingual nerve. The needle is now pushed very slowly forward, always keeping in close touch with the bone and depositing fluids in its way, until it is pushed in about five-eighths of an inch. It is important carefully to feel the way along the bony wall of the ramus, as the needle may have to pass over the roughened and bony elevations, which afford attachment to the internal pterygoid muscle. During the injection the syringe should remain in the same horizontal position as heretofore outlined. Soon after the injection, paresthesia of one-half of the tongue

on the side of the injection occurs, which is soon followed by anesthesia of the mandibular nerve. Paresthesia of the mucous membrane and half of the lower lip is also established. The pulps of the lower teeth, including the cuspid and lateral incisor and the gum tissue on both sides of the jaw, are anesthetized, including a part of the anterior floor of the mouth. The complete anesthesia of the two nerves also anesthetizes the whole alveolar process in this region. About five minutes are required for the complete anesthetization of the lingual nerve, and at least fifteen minutes for the mandibular nerve. Braun claims that the injection is absolutely free from danger, while Romer states that danger may arise if the whole quantity of the solution should accidentally be injected into a vein.

The mental foramen lies midway between the superior and inferior border of the body of the mandible on its external surface, usually below the second bicuspid teeth. Its opening always faces posteriorly. An injec-



Fig. 12. Injection into the mandibular foramen.

tion near this point increases the anesthesia in the bicuspid region. The incisive fossa is a shallow depression on the external surface of the mandible between the cuspid teeth. It may be located by the palpating finger immediately above the chin. A number of small foramina are found in this region for the passage of nerves and nutrient vessels. The lower incisors may be anesthetized by making injections anteriorly into the incisive fossa and one posteriorly in the region corresponding to the fossa. Usually, peridental anesthesia is to be preferred for these teeth.

Conductive anesthesia is serviceable if a number of teeth have to be removed at one visit. It should be borne in mind, however, that in average, only one-half of either jaw should be anesthetized at one sitting so as to keep the quantity of the injected anesthetic solution within the limits of ordinary dosage.

*The Injection Into the Pulp.* By pressure anesthesia, pressure cataphoresis, or contact anesthesia, as the process is variously termed, we understand the introduction of a local anesthetizing agent in solution by mechanical means through the dentin into the pulp for the purpose of ren-

dering this latter organ insensible to pain. Simple hand pressure with a suitable instrument, the hypodermic syringe or the so-called high pressure syringe, is recommended for such purposes. Regarding the principles of pressure anesthesia, it should be remembered that we cannot force a liquid through healthy dentin by a mechanical device without injury to the tooth itself. If a cocaine solution is held in close contact with the protoplasmic fibers of the dentin, the absorption of cocaine takes place in accordance with the law of osmosis. The imbibition of the anesthetic is enhanced by employing a physiological salt solution as a vehicle. On the other hand, living protoplasm reacts unfavorably against the ready absorption of substances by osmosis for two reasons: (1) Its albumen molecule is relatively large and not easily diffusible, and (2) as an integral part of its life it possesses "vital" resistance toward foreign bodies. These latter factors are sufficiently demonstrated by the fact that it is very difficult to stain living tissue. Dehydration of the protoplasm increase the endosmosis of the anesthetic solution markedly.

When we apply the same "pressure" anesthesia upon carious dentine, the above statements do not hold good. We are able to press fluids quite readily through carious dentine. We must bear in mind that such dentine has been largely deprived of its inorganic salts, leaving an elastic spongy matrix in position. By drying out this dentine and then confining the anesthetic solution under a suitable water-tight cover, the pressure applied by the finger is quite sufficient to obtain the results. Colored fluids may be readily pressed through such dentine and even stain the pulp.

In teeth not fully calcified and in so-called soft teeth, pressure anesthesia is more readily obtained while, according to Zederbaum, the process fails in "teeth of old persons, teeth of inveterate tobacco chewers, worn, abraded and eroded teeth, teeth with extensive secondary calcific deposits, teeth whose pulp canals are obstructed by pulp nodules, teeth with metallic oxides in tubules, teeth with leaky old fillings, badly calcified teeth—mainly all from one and the same cause, namely, clogged tubuli. In most cases no amount of persistent pressure will prove successful."

From the foregoing it will be observed that the so-called high pressure syringes possess little merit relative to pressure anesthesia. The pressure which can be produced by a good working all-metal syringe, holding it between the index and middle fingers and forcing the piston with the thumb, amounts to 250 to 300 pounds in the average man. The pressure required in pressure anesthesia to produce a perfect contact is usually much less than the above force.

*Methods of Anesthetizing the Pulp.* 1. The pulp is wholly or partially exposed: Isolate the tooth with the rubber dam and clean it with water and alcohol. Excavate the cavity as much as possible and if the pulp is not exposed, dehydrate with alcohol and hot air. Saturate a pledget of cotton or a piece of spunk with a concentrated cocaine or novocaine solution, place it into the prepared cavity and cover it with a piece of vulcanizable rubber and with a suitable burnisher apply slowly, increasing continuous pressure



from one to three minutes. The pulp may now be exposed and tested. If it is still sensitive, repeat the process. Loeffler states that "this pressure may be applied by taking a short piece of orange wood, fit it into the cavity as prepared, and direct the patient to bite down upon this with increasing force. In this way we can obtain a well-directed regulated force or pressure, and with less discomfort to the patient and operator." Miller described this process as follows: "After excavating the cavity as far as convenient and smoothing the borders of it, take an impression in modeling compound, endeavoring to get the margins of the cavity fairly well brought out; put a few threads of cotton into the cavity and saturate them thoroughly with a 5 to 10 per cent solution of cocaine, cover this with a small bit of rubber dam, and then press the compound impression down upon it. We obtain thereby a perfect closure of the margin, so that the liquid cannot escape and one can then exert pressure with the thumb sufficient to press the solution into the dentine."

2. The pulp is covered with a thick layer of healthy dentine. With a very small spade drill bore through the enamel or direct into the dentine at a most convenient place, guiding the drill in the direction of the pulp chamber. Blow out the chips, dehydrate with alcohol and hot air, and apply the syringe provided with a special needle, making as nearly as possible a water-tight joint. Apply slow, continuous pressure from two to three minutes. With a round burr the pulp should now be exposed, and if still found sensitive, the process is to be repeated.

Recently a method has come into vogue which allows successful anesthetization of the pulp by injecting the anesthetic solution around the apex of the tooth. The spongy alveolar process, which contains lymph channels, allows the ready penetration of the fluid. The injection should be made close to the bone, pushing the needle slowly toward the apex, while the fluid is deposited drop by drop. No wheal should be raised by the injection, otherwise the benefits of the pressure from the dense gum tissue is lost.

According to Hertwig, the protoplasm of the cell primarily transfers irritation and, secondly, transmits absorbed materials. Therefore, the anesthetic solution has to pass through the entire dentinal fiber before the nerve tissue of the pulp proper is reached. Consequently a certain period of time is required before the physiological effect of the anesthetic is manifested. This period of latency is dependent upon the thickness of the intermediate layer of dentine or bone. The successful anesthetization of the pulp depends largely upon this most important factor of allowing sufficient time for the proper migration and action of the drug.

The anesthetizing of the peridental membrane for the treatment of pyorrhea alveolaris is a comparatively simple matter if carried out according to the methods as outlined under the heading of peridental anesthesia. Sometimes a topical application of a fairly concentrated novocaine-adrenalin solution (about 10 per cent) and applied to the pockets by means of cotton ropes accomplishes the desired purpose. The surgical treatment

of pyorrhea is materially simplified if the tissues under consideration are relieved of sensation.

*Local Anesthesia for Operations About the Mouth, Exclusive of the Extraction of Teeth.*

In operating about the mouth for an abscess, a cystic or a solid tumor of the approximate size of a large walnut, a malposed tooth, or for any other purpose, the rhomboid infiltration according to Hackenbruch, affords the simplest means of producing a most satisfactory anesthesia. After previously cleansing the field of operation with an antiseptic solution, a very small drop of phenol is placed at A and B (Fig. 13) to superficially obtund the point of puncture. The needle is quickly thrust through the mucosa at A, and at once slow pressure is exerted on the piston, moving the needle steadily along the external line of the tumor. The needle is now partially withdrawn, without, however, leaving the original puncture, and a second injection or as many as may be needed are made in opposite direc-

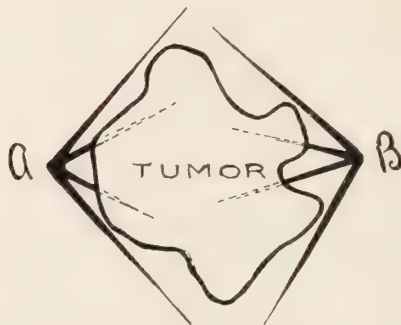


Fig. 13. Anesthetizing a small tumor by Rhomboid Injection. (Hackenbruch.)

tions. This maneuver is now repeated at B, and thus a circumscribed infiltration of the whole tumor is obtained. If the tumor, etc., is very large, additional punctures and injections may be made as outlined in the schematic drawing. After ten to fifteen minutes' waiting the extirpation of the tumor may be begun. For injecting the soft tissues other than the gum, a 1 per cent novocaine-adrenalin solution — one tablet dissolved in 2 c. c. of water — is quite sufficient.

The anesthetization of the soft and hard palate is comparatively easily accomplished. The injection on the hard palate is started at the gingival edge of the alveolar periosteum on both sides of the jaw toward the median line. As the gum tissue is extremely dense, great force is required for a complete infiltration in this region, and only small quantities of the solution are required. The soft palate is easily infiltrated by inserting the curved needle posteriorly to the third molar.

Small tumors and cysts on the tongue or the floor of the mouth are best anesthetized by the rhomboid infiltration of Hackenbruch. For the complete extirpation of a ranula, the injection is made into the cyst wall

near the periphery, after which the cyst is slit open and a small quantity of the anesthetic solution is injected into the inner surface of the cyst. Large cysts, tumors, and major operations on the tongue require the anesthetization of both lingual nerves. In injecting and operating on the floor of the mouth, the index finger of the left hand should be placed on its external surface as a guide to the needle or the knife.

Local anesthesia is indicated in all minor and in relatively many major operations on the mucous surfaces, the skin, and the teeth. Local anesthesia is not a substitute for general anesthesia; its usefulness is materially increased by familiarizing one's self with the modern methods of its production and with a perfect mastering of the technique. The danger of poisoning has been practically eliminated by using isotonic solutions containing a relative small percentage of the anesthetic in combination with the alkaloid of the suprarenal capsule. Even if the danger of general necrosis is small under the very best conditions, the danger from local anesthesia is always less. The greater majority of all dental operations can be safely carried out under local anesthesia, provided the operator has acquired a complete working knowledge of the various components which, as a whole, constitute this important branch of dental therapeutics.

*(To be Continued)*

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## A UNIVERSAL METHOD OF ORTHODONTIA BY MEANS OF REMOVABLE APPLIANCES.\*

By O. W. Briner, D. D. S., New York, N. Y.

WHILE a thorough knowledge of the causative factors of malocclusion and a similar knowledge of the numerous tissue changes directly and indirectly involved in their correction are very essential requisites to the successful practice of Orthodontia, these considerations are the same in all rational methods of correcting dental irregularities. The only radical difference lies in the manner of applying the force necessary for treatment, and the writer will here confine himself entirely to this phase of the subject. Since the idea of tooth movement was first conceived, numerous fixed and removable regulating devices have been introduced by the dental profession, but none have met with such well-merited success as the fixed appliances invented by Dr. Angle. To Dr. Angle we are also very greatly indebted for the clearest, simplest, most practical and comprehensive classification of malocclusion. Highly progressive as these innovations have been, there is still very much to be hoped for in the development of Orthodontia appliances before we may be said to be nearing the ideal, and, in our effort to attain that lofty height of perfection, the



writer is fully convinced that the dental profession is not devoting sufficient attention to the removable type of appliance, for it is this form of contrivance which undoubtedly presents the greater possibilities for approaching idealism. Nature's inherent force is the only one which we recognize as ideal for establishing normal occlusion. It is the one force which may be said to accomplish that result with the least possible amount of inconvenience to the patient, and we might consider a method ideal for assisting Nature correct malocclusion which meets that one requisite of being in every respect the least inconvenient to the patient. To thoroughly fulfil that requirement, the appliances and method of their manipulation must meet the following five conditions: the method must be (1st) the least painful, (2nd) the most efficient, and (3rd) the most hygienic. (4th) The appliances should be invisible and not interfere with any of the functions of the oral tissues. (5th) The method should be the least expensive, hence requiring the least amount of service from the Orthodontist. We will refer later to these five important considerations. In an endeavor to approach

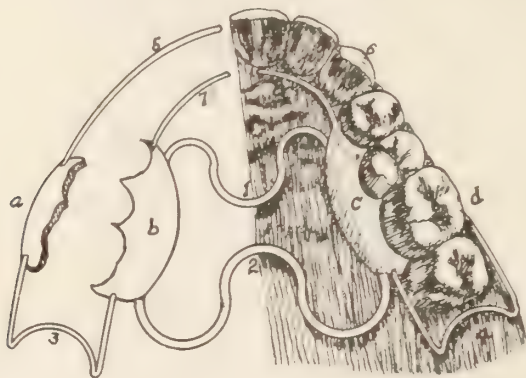


Fig. 1

this standard as nearly as possible, the writer devised a method of treating malocclusion of which the following is a brief general synopsis.

The accompanying diagrammatic illustrations (Figs. No. 1 and No. 2) represent removable appliances which, with certain modifications, have practically a universal application.

Fig. No. 1 demonstrates the adaptability of this method to the upper teeth, and shows one-half of the appliance in position on the arch and the other half as it would appear outside of the mouth.

#### COMPOSITION

The parts lettered A, B, C and D are made of vulcanite, and the balance is composed of gold plated German silver wire. Soft solder is used in uniting the wires, and small pieces of German silver plate are soldered to the wire framework to strengthen the rubber attachment.

## SIMPLE FUNCTIONS OF THE VARIOUS PARTS. ARCH EXPANSION AND CONTRACTION

The vulcanite portions retain the appliance in position. They embrace the posterior teeth close to the gingiva, the lingual pieces, B and C, lying close to the roof of the mouth. The curved palatal spring wires, No. 1 and No. 2, also lie close to the roof of the mouth and are used to expand or contract the arch laterally. At No. 3 and No. 4 the wires curve around the alveolar ridge from the lingual to the buccal side and act as springs. The labial wires, No. 5 and No. 6, are for moving the front teeth inwardly, and the lingual wires, No. 7 and No. 8, are for pushing the same teeth outwardly.

In order to expand the arch laterally, the palatal wires are bent so as to enlarge their curve, thus causing an outward spring pressure when the appliance is returned to its position in the mouth. To contract the posterior portion of the arch, the palatal wires are bent so as to decrease their curve, thus causing an inward spring pressure on the arch from the buccal side. By bending the labial wires lingually, the anterior portion of the arch is contracted, and by bending the lingual wires labially, this portion of the arch is expanded. Where pressure is not wanted on a tooth embraced by vulcanite, the vulcanite is there filed away.

## INFRA OCCLUSION — FORCIBLE ERUPTION

The method used for forcible eruption may be illustrated as follows: Let us suppose that we have a right upper canine which is still high above its normal position in the arch. A small screw is anchored in the crown of the tooth and the right labial wire is bent to come slightly under the head of the screw when the appliance is inserted in the mouth. The wire is then lifted gently over the screw and the spring pressure forces it down. By proper bending of the wire, the tooth can be forced not only down, but at the same time in any other direction. In cases of infra occlusion of posterior teeth, the same method can be adapted to that portion of the arch by the same principles of wire bending applied to the palatal wires.

## SUPRA OCCLUSION

While occipital anchorage is usually indicated in these cases in the manner suggested by Dr. Kingsley, however, where the malocclusion is slight and confined to the anterior teeth, the condition may be corrected by using the same method as described under forcible eruption. In this case the labial wire is bent under the screw, thus forcing the tooth into its socket. By embodying occipital anchorage in connection with that type of appliance described under "Overcoming Resistance Caused by Interlocking of the Cusps," supra-occlusion may be corrected in the posterior portion of the arch. In cases of pronounced supra-occlusion of the anterior teeth, occipital anchorage employed as just described will overcome the tendency of the labial wires to pull the posterior teeth into supra-occlusion.

## TORSO-OCCLUSION      TOOTH ROTATION

The rotation of a tooth is accomplished by the combined action of a lingual and a labial wire -- one causing inward pressure on the mesial portion of the tooth, and the other causing outward pressure on the distal portion, or vice versa. One wire is often sufficient to effect this result.

## UNILATERAL MALOCCLUSION

In cases of unilateral malocclusion, the appliance is constructed so that the maloccluding teeth are controlled by one lateral half of the palatal wires and the remaining portion of the arch by the other lateral half. The two ends of the palatal wires which control the maloccluding teeth are then bent gradually in the direction in which we wish these teeth to be moved. Modifications in the details of the construction must be made of course to cover all the requirements of each individual case. Where the unilateral malocclusion is complicated with other irregularities, the abnormal conditions may all be corrected at the same time by proper bending of the wires.

## MOVEMENT OF ROOTS

For the movement of roots the leverage principle is used as follows: To expand the apical arch, the labial wires are used as the motive force and are bent so as to exert pressure close to the occlusal surfaces of the teeth. The lingual wires, resting close to the necks of the teeth, are used as the fulcrums. To contract the apical arch, the process is reversed. By means of fixed notched bands cemented to one or more suitable teeth, the tendency of the wires to slip over the hard, smooth surfaces of the enamel is overcome.

The appliance could also be used in connection with the bars and bands of Dr. Case's Contouring Appliance for moving roots. Where the apical arch is to be contracted the bars and bands are used in the same manner as suggested by Dr. Case. When expansion of the arch is indicated, the bars are extended up from the bands flush with the teeth and gums and then bent occlusally into an elongated loop for the reception of the labial wires.

## LOWER APPLIANCE

For the lower jaw the appliance is practically the same as for the upper and is shown in Fig. No. 2, the essential difference being that the action of the palatal wires is here supplied by the lingual spring L. After bending this wire at the median line, it should also be bent on both lateral halves to allow for the unequal movement thus caused between the posterior and anterior portions of the appliance. Otherwise what is said of the upper is usually also applicable to the lower appliance.



## OCCIPITAL ANCHORAGE — CAP AND BIT

The cap and bit principle can be very advantageously applied in addition to the regular appliances by soldering a tube to each of the posterior portions of the labial wires. From each of these tubes a wire is bent to the corner of the mouth, and then out and slightly backward for its attachment to the cap. If square tubing and wire is used, the bit pieces

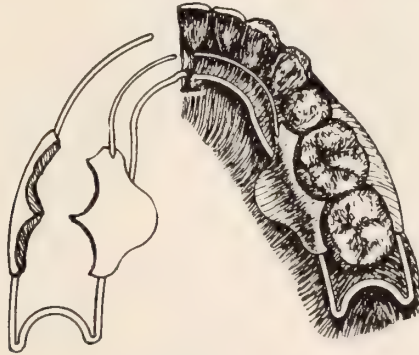


Fig. 2

are rigid. If round tubing and wire is used, the consequent rotary movement of the bit pieces gives the patient a wider and more comfortable range of head movement during the sleeping hours. To prevent these pieces from becoming dislodged by the movement of the head, a stout cord is used in addition to the rubber attachment to the head gear.

## RIGIDITY

By filing away a portion of the vulcanite which rests over the interproximate embrasures, the appliance is made less rigid. This is usually best accomplished in the buccal region to admit of easy removal of the appliance by the patient. On the other hand the rigidity may be increased at any portion of the arch by means of fixed notched bands cemented to one or more suitable teeth, the notches being made to receive the appliance at that particular portion of the arch. The rigidity may also be increased by extending arms of the vulcanite from both the lingual and the buccal interproximate embrasures and allowing these arms to encroach as far as possible on to the occlusal surfaces of the teeth without interfering with the bite.

## REMOVAL

With proper instruction of the patient, the removal of the appliance can be accomplished in most cases with the fingers. However, where there is danger of the patient distorting the wires by this process, the removal is safely accomplished by the use of forceps in the following manner: Before vulcanizing, four pieces of tubing are soldered to the

wire framework at the positions occupied by the letters A, B, C and D, of Fig. 1. The palatal ends of the tubes can be sealed to prevent any possible injury to the underlying soft tissues by the forcep beaks. The openings of the lingual tubes are on a slightly lower horizontal plane than the buccal tube openings when the appliance is in position in the patient's mouth, and leading to the lingual openings two V-shaped troughs are made in the vulcanite to guide the forcep beaks to the tube openings. Fig. 4 gives a diagrammatic view of the forceps.

These consist of two shanks pivoted at P. At the lower end of the shanks we have handles and on the other side of the pivot we have the forcep beaks. Each shank supports two beaks—one beak for the lingual tube on one side and the other beak for the buccal tube on the other side of the arch. The general form of this instrument is made to conform as

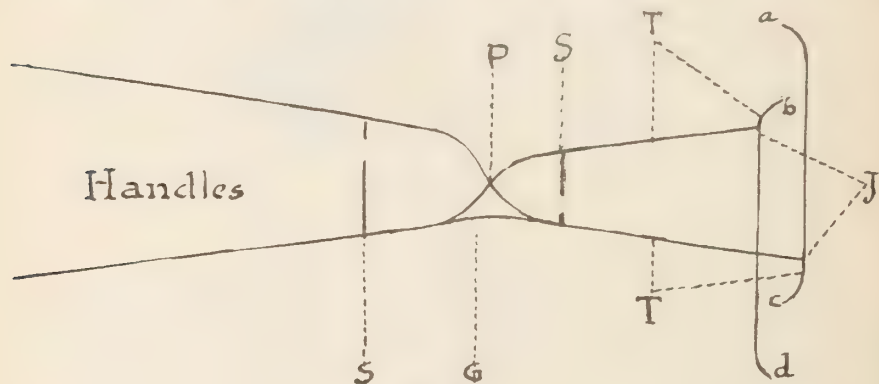


Fig. 4

much as possible with the surface form of the oral tissues. A, b, c and d are the beaks. The parts marked S are stays to limit the movement of the shanks. G is a spring to keep the shanks closed. At J the parts are jointed and tightened by a nut. At T the parts are united by a telescoping joint and made tight by a screw. This arrangement allows for every possible adjustment and readjustment of the forceps to the tubes. The stays prevent the patient from exerting more pressure on the appliance than is necessary to accomplish its removal from the mouth. The forceps relieve the arch of pressure at all points, and the removal of the appliance is thus easily accomplished.

#### OTHER MATERIALS

Other materials may be used in place of German silver and vulcanite. A fusible metal, such as aluminum or gold, may be substituted for the vulcanite parts, while any suitable spring wire, such as iridio-platinum or piano wire, can be substituted for the balance. For instance, we could substitute cast clasp gold for the vulcanite parts and very thin iridio-platinum wire for the balance, making a beautiful appliance of the type

shown in Fig. 3. This appliance is unaffected by the oral fluids, and its size is reduced to a minimum. The hard, smooth contact of the gold and enamel is avoided by lining the contact surface of the appliance with a thin coating of soft gutta percha.

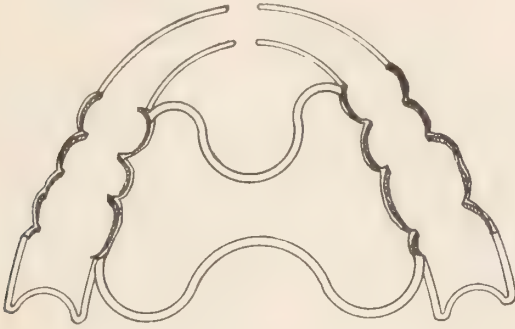


Fig. 3

#### APPLIANCE MODIFIED TO SUIT THE CASE

The size and shape of the vulcanite parts and the particular teeth which they are to embrace will vary, of course, according to the case at hand, as will also the various wire parts of the appliance; and by a suitable combination and modification of the different features and principles advocated, a very great variety of movement can be obtained. That portion of the appliance embodied by the palatal wires and the two vulcanite pieces, B and C, can be used alone in the mouth, or with any or all of the other features. That portion of the appliance represented by the vulcanite pieces A and B, and the intermediate spring No. 3 may also be used alone or it may be applied with either or both of the wires No. 5 and No. 7. When desired, these wires may be extended from one side of the jaw to the other. The same may be said of the corresponding parts on the other side of the appliance. Where it is desired to change a wire during the course of treatment in order to alter its size or vary its function in some way, that wire can be inserted in tubing and may thus be readily replaced with the desired alteration.

#### FRAMEWORK APPLIANCE

Instead of employing vulcanite to hold the appliance in position, we could use the wire framework alone and retain same in place by the use of four or more fixed bands cemented to suitable teeth, the bands possessing notches usually soldered on the lingual side for the reception of the wire framework. Shoulders made of tubing or half tubing and soldered to the framework will hold the appliance securely in position and prevent it from sliding along the notches.



## APPLIANCE OPERATED BY RUBBER BANDS

The expansion or contraction of the anterior portion of the arch may be accomplished automatically in some cases by the action of square wire operated through square tubing by the action of rubber bands. Four pieces of tubing are soldered underneath the vulcanite, the ends of the tubes being allowed to extend slightly beyond the rubber. Through these tubes four square wires are bent to conform with the positions of the labial and lingual wires of Fig. No. 1. The posterior ends of the two lingual wires extend some distance beyond the tubing, depending on the distance the teeth are to be moved. At the posterior end of each lingual wire is a deep notch for the reception of one loop of the rubber band. The other loop goes over the anterior end of the tubing and rests in between the tubing and the teeth. The labial wires have a small spur soldered on anteriorly to the tubing. This spur secures one loop of a rubber band, while the other loop goes over the posterior end of the tubing, resting in between the tubing and the teeth.

The action of the rubbers may be limited by numerous methods to prevent their constant pressure. This can be accomplished by nitching up successive pieces of the square wire along the edge and then filing the splinters flush after they have served their purpose. Probably the most satisfactory way is to thread the edges of the wire and regulate the action by a nut. The rotation of this nut can be avoided by soldering thereto a small piece of wire which enters a corresponding piece of tubing in the vulcanite. All the wire parts which extend beyond the tubing may be rounded off for the comfort of the patient. By threading these wires properly, they could also be operated by nuts without the rubbers, but the rubber band arrangement is preferable.

RUBBER BAND APPLIANCE USED TO CORRECT DISTAL OCCLUSION CAUSED BY THE  
EARLY LOSS OF LOWER FIRST MOLARS

The value of the rubber band appliance is well illustrated in this operation. A vulcanite anchorage plate is made to embrace all of the teeth anterior to the vacancies left by the lower first molars. It may be either a plain plate or conform with the principles exhibited in Fig. No. 2. In the posterior end of this plate, on each side, is embedded a horizontal piece of German silver wire. This wire is bent in the shape of a "U" around the second bicuspid on each side of the arch. To that portion of the "U" which occupies the buccal portion of the arch a square piece of tubing is soldered along its entire length. Through this tubing a free piece of square wire is passed and extended backward a short distance and then bent so as to embrace the second molar. This embrace may be made very accurately, if desired, by vulcanizing rubber on to the posterior part of the free wire and allowing the rubber to come in contact with as much of the buccal, mesial and lingual surfaces of the second molar as is deemed necessary.

The anterior free end of the wire is deeply notched for the reception of one loop of the rubber band, while the other loop of the rubber goes over the posterior part of the tubing between the tube and the "U" shaped wire. The pressure of the rubber is limited by one of the methods described in the preceding chapter. This same principle can, of course, be applied to other portions of the arch.

#### JOINTED APPLIANCES — AUTOMATIC REGULATION

In some cases it may be found expedient to make a hinge joint at that part of the appliance represented by No. 3 and No. 4 of Fig. No. 1. This joint allows the labial wires to swing on a horizontal plane and is closed by the action of rubber bands. Where there is a vacancy in the arch caused by the loss or non-eruption of a tooth, the rubber may be conveniently stretched across this space, a loop of the wire framework or a soldered piece of wire being extended up on each side of the vacant space to enable the rubber to clear the alveolar ridge. Where there is no vacant space in the arch, the joint may be closed by the same principle applied in back of the last tooth. Joints may also be made at suitable places depending on the requirements of the case, along the labial or lingual wires, allowing these wires to swing on a horizontal plane. These wires can then be operated by a rubber band stretched between the wires, or where there is no breach in the arch for the passage of the rubber, the joint may be operated by a small flat steel spring.

By making a joint in each of the palatal wires in the median line and also near the four places where the palatal wires enter the vulcanite, and then operating the median joints by two "U" shaped springs attached to the wires near the joints so that both arms of the "U" will tend to extend outward, the posterior teeth of the arch can be expanded, and by placing the "U" shaped spring on the outer side of each palatal curve, with a tendency of the arms to approach each other, the posterior part of the arch may be contracted. This form of appliance in connection with the square tubes and square wire operated by rubber bands, as previously described, embody the requirements of a universal automatic regulator. This can also be made of the framework type.

The same principles can be applied to the lower jaw by discarding the lingual wire L (Fig. No. 2) and operating both lateral halves of this appliance by the tube, wire and rubber contrivance attached to the labial wires in front of the anterior lower teeth. To the anterior portion of one labial wire the tube is attached, while the other labial wire is extended into this tube and then slightly beyond to the other side of the arch. The free end projecting beyond the tube is notched for the reception of one loop of the rubber and the other loop is attached to a suitable spur soldered to the tubing on the opposite side of the arch. The labial wires may in turn be of the automatic type, care being taken in designing the parts so as to admit of their easy insertion and removal.

*(To be Continued.)*

## THE GOLD INLAY vs. GOLD FOIL FILLING.\*

By J. K. Douglas, D.D.S., Sandusky, Ohio.

IN THE practice of the dentistry of today we are constantly coming in contact with new methods and new materials, which, in many cases, are taken up by all classes of the profession far and wide and become fads with many who become enthusiastic, and in course of time are either discarded altogether or take their place among others, to be used where best indicated. So we now have a great assortment of filling materials, each having its individual good qualities for the preservation of tooth tissues, and much depends upon the judgment of the operator as to where these different materials should be used to obtain the best results.

It is impossible to select any one material or method and pronounce it the ideal and use it in every operation. The gold inlay is one of these methods for the preservation of tooth structures that has come to us in recent years, and, as has been said by many who are strong advocates of the foil filling, it has come to stay; and is being used (and abused) by many; but it has its place among other methods, and the conscientious operator is using it where his good judgment tells him he can save tooth structure better with it than with other fillings.

The gold foil filling, which has been the stand-by for these many years, should not be discarded by any means: for the foil filling, made by the hands of a master workman (and I claim that the man who can make a *good* gold foil filling in all cases is a master workman), has proven its value as a permanent restoration by the test of time.

In discussing the merits of the gold inlay compared with foil filling, let us take the approximal cavities in bicusps and molars: places where the average operator finds it most difficult to make a gold foil filling. Few are the men who are absolutely sure of condensation of the foil and perfect adaption in these places, and unless there is perfect adaptation (using the words of Dr. Conzett) it is the poorest material that can be placed in a tooth.

While I do not intend to take up the technique of making an inlay, it should be borne in mind that on the cavity preparation depends everything, and with the inlay, as with the foil fillings, we should in all cases adhere to the method of Dr. Black and others, which is extension for prevention, with well extended perpendicular walls, beveled edges and flat seat. Observation of fillings and inlays made by the thorough operator, with this preparation and carefully manipulated throughout, seems to be a toss-up as to which will be the most lasting restoration.

Let us take these same cavities in the hands of the average operator. Before the coming of the inlay a great many of these were filled with alloys which made substantial restoration, but not esthetic, to say the least. In many of these cases alloy was used for no other reason than that it

\*Read before the Ohio State Dental Society, 1911.



placed the patient and operator in a position to undergo a long, tedious ordeal to do the operation with foil. Today, many of those men are making inlays (also failures), but in their hands I think they are saving more teeth, doing better work with the inlay than with other materials in this class of cavities, as the person doing inlay work must necessarily extend the walls sufficiently to remove the wax impression, and in so doing must observe the laws of extension for prevention more than they were accustomed to do in the foil filling.

One of the strong points for the inlay in this class of fillings is that the average operator can retain the interproximal space and contact point better than with any other filling. After the inlay is seated in the cavity, should the contact point be deficient it can be removed and a piece of gold sweated to this point, making the contact ideal. By trimming the wax impression while in the cavity (and, if necessary, the inlay after it is cast) there should be no excuse for not having the interproximal space and contact point normally restored.

Another class of cavities where the inlay can be used to better advantage than other fillings, is in the buccal and lingual surfaces; those places which are so hard to adjust a rubber dam to and can only be done by the use of the clamp, which causes the patient much annoyance as well as excruciating pain, can be restored very satisfactorily with the inlay, with little pain to the patient and less annoyance to the operator than those made with foil.

Another filling that is difficult for the average operator to make with foil is the distal surface of the cuspid. It is one of the most difficult places to get a direct blow on the foil to condense properly, and many times it is necessary to remove good tooth structure, bringing the cavity out to the labial surface so that the filling is conspicuous in order to place the foil, while with the inlay the cavity is opened on the back of the tooth, extending well in to the palatal surface, leaving as much of the labial surface as is practical, seating the inlay from the back.

There are cases in the incisors where the inlay can be used to a better advantage than the foil, one of which is the large approximal cavity involving a portion of the cutting edge. Some may say that no ethical dentist would use gold in such a place; but we are not all of us a howling success when it comes to making porcelain inlays, and many of my gold fillings in these places look more esthetic after a period of four or five years than my porcelains do. In the above class of fillings the preparation of the cavity can be made for the inlay and not sacrifice any more of the healthy tooth structure than for a foil filling, and still have stronger walls. In these cases we can use the platinum pins set into the dentine on the incisal edge; also in the gingival seat, if necessary, which draw away with the impression and cast into the gold, making not only a strong retainer but has less tendency to weaken surrounding tooth tissue. Or, in a case of this kind where the pulp is removed by the use of a post extended into the root

canal with a properly shaped step or small pin at the incisal edge, we can make a most wonderful restoration, and it can be done in less time and with more comfort to both patient and operator than the insertion of a foil filling.

Then we have those cases of abrasion, where there is little or no decay. They can be restored with very little cutting of the tooth by the use of seating pins in the dentine, a safe distance from the pulp, to retain the inlay. With these same cases the foil filling is tedious, necessitating more cutting away of dentine for anchorage, and the dentine in these cases is usually very sensitive.

In cases of children, where we are called upon to make a filling in the occlusal surface of their sixth-year molars, I find that I am making a great many inlays where I used to think it almost impossible to place a gold foil filling, as few children from the age of six to twelve will sit for the time it takes to adjust the dam and make a foil filling. But it is surprising how, with the use of the chisel and stones, we can prepare these cavities; and should the cavity be of such depth as to endanger the pulp, such materials as may be advisable may be placed over the dentine and partially filled with cement, impression made with the wax and the inlay can be set at some subsequent sitting, and you have had no more trouble with the child than placing any of the plastic fillings.

Before we had the inlay too many of these cases were filled with amalgam rather than to attempt filling with gold foil. A point in favor of the inlay which I have observed in my own practice is that with the number of large inlays which have been inserted a very small percentage have been sensitive to thermal changes, and the death of a pulp very seldom takes place under an inlay. I attribute the cause to the thin layer of cement between the dentine and inlay, which comes in contact with the ends of the tubuli and acts as a non-conductor.

Just a word about the failures we see where the inlay has been used. We certainly have failures with the inlay, and we do with the foil; but when we stop to think how long the foil has been used as a filling material and that we are profiting by the experiences of the men of the profession for nearly a century, and consider, too, that every man who attended college during this period had the technique of the foil filling drilled into him from start to finish. With the inlay only the few men who finished college recently have had any school training in the technique of the inlay, and the rest of us have had to grasp it as we could; largely from watching clinics at our meetings or by what we could get from our journals, etc., so those inlays that were made during the first few years were largely experimental and are the ones that we are watching, and profiting by their failures. What would happen if the foil filling had not been used until this day and given to the profession, and it should become as popular as the inlay has? Would there be any comparison in the number of failures with those that we are having with the inlay? I think that we are doing much

better work with the inlay, considering the time we have been using it, than we could with the foil with the same experience. We are using the inlay in teeth which are badly broken down, places where it was nearly impossible to place a foil filling and the gold or porcelain crown was used. In such places the inlay makes not only a substantial, but a good looking restoration. I prefer the inlay in the cases mentioned, as I feel that I can do just as good, and in many places, better work than with foil. It is less tedious to the operator and more humanitarian to the patient.

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## THE SWEATED GOLD INLAY VERSUS THE CAST GOLD INLAY.\*

By Dr. Henry Barnes, Cleveland, Ohio.

**I**NCREASED efficiency is the key-note of the day. Efficiency means that all unnecessary steps be eliminated. Efficiency means the most economically produced result, but never at the expense of quality. Efficiency rather enhances quality.

Many years ago a railroad company offered a prize to the engineer who should, during the period of one year, use the least oil without impairing the efficiency of the engine. The prize was awarded to one who had used so small a quantity of oil and so much less than his fellow competitors that the officials marveled, and finally obtained the secret from the engineer. He had placed a child's marble within the oil box; this closed the oil channel when the engine was idle, permitting no waste of oil. When the engine was in motion, however, the marble rolled and permitted enough of the oil to escape to properly lubricate the bearings. This is a principle used the world over today in controlling lubrication. It is a simple story of waste eliminated.

The question of efficiency in our work is vital, and it is from this standpoint that I desire your attention. I hope to show you how increased efficiency may be secured in the production of the inlay by eliminating all machines, expensive or otherwise — investments — wax or wax gold, at — per ounce for wax (?), not to mention failures, which in casting cannot be known until all your toil and expense have been expended. I hope to enlist your interest in a method which, for me, is not equalled or approached by any known method of the day — a method direct and in which errors may be detected as soon as made, and immediately corrected with a result so sure that the failures are very few indeed. I do not expect to enthuse you with my enthusiasm, but for your own sakes I wish I might. I wish to assure you that there is nothing of commercialism about the method, this being also eliminated.

Were I to enumerate the many discouragements occurring in gold inlay casting, with its many failures when compared with the very few

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\*Read before the Ohio State Dental Society, 1911.



successful results obtained, the fifteen minutes allowed for this paper would be entirely consumed. I purpose rather to allow you who follow in discussion, and who are relying upon this method as a practice, to tell your woes.

From 1903 to the present time the aim has been to evolve a simple method which should eliminate all unnecessary steps. I turned aside for a time, spent my good money for worthless machines, which produced worthless results and, admitting complete failure in this field, again turned to my first love. Proven and well-known principles have been employed and, I may add, with a large measure of success.

Whether you agree with my conclusions or not makes no difference, so far as personal experience goes, but something may be found in that which is herein offered to help you in future practice.

The gold inlay is yet in its infancy. Pioneering is not yet obsolete.

Believing as I do in the inlay as a means to preserve and as a substitute for lost tissue, and realizing its many advantages, my efforts have been directed to the simplifying of the technic.

Beginning with the solder inlay in a platinum or gold matrix, my failures equalled your own. However, success seldom immediately follows first efforts and failures only whetted the ambition to succeed.

In 1905 the platinum matrix with pure gold sweated therein was introduced. It is unnecessary to repeat that technic as it was published in *The Dentists' Magazine* and other journals of that time. Clinics were also given before this and other societies. This was and is still a good working method, but the law of progress holds in this field, as in all others, hence the presentation today of the latest and, from personal experience, the best method. The technic has been still further simplified and the resultant inlays are such as to defy even experts to tell whether they are inlays or gold-malleted fillings.

Gold may be considered as a peculiar metal, jealous of her laws, but a very faithful servant if rightly used. It is for us to study and observe these laws, working harmoniously therewith.

If any of you, after hearing this paper, seeing the exhibits and viewing the clinics to be given on Thursday, shall conclude that your inlay troubles are solved, I assure you that you may find that a mistake has been made. I am not trying to make you believe that the method to be hereafter described is a difficult one — it is not — but it is difficult for those who do not or who will not take the simple precautions necessary to produce the desired results.

If the work is performed in accord with the physical properties of gold — the metal used — success will be easily achieved. (Note experience in Gray's Armory.)

The cast gold inlay is not a facsimile of the wax model. This is due to the expansion and contraction resulting from the extreme of heat and cold to which both inlay and matrix investment are subjected. Both the

gold inlay and the investment change in form and size. The sweated gold inlay does not change appreciably either in form or size.

#### THE METHOD

Soft gold foil — not absolutely non-cohesive — sufficient to fill the cavity when compressed, is condensed within the prepared cavity. The gold may be rolled into a ball or used in rope form, as preferred. Suitably pointed orange-wood sticks are the instruments mainly used. For compressing gold use the following point forms — round, square, rectangle, V and crescent. For burnishing margins use V, crescent and spatulate forms. Wood is preferred because it condenses the gold uniformly, leaving no pits. This is a very important point, as pits prevent the flow of the gold plate, or do not fill properly. The mass of gold is compressed to the form and contour as described in the finished inlay, except that a little excess is allowed for covering the margins — this is to protect the margins during sweating process.

To more definitely describe the method, I shall use as illustration the filling of a mesio-occlusal cavity in a molar.

The gold is rolled into an ovaled ball, then flattened and bent to conform to general cavity shape, much like the letter L. It is now placed over and into the cavity, using the points previously described to pack the mass solidly within the cavity walls. The V and ( forms are now used to condense margins. The spatulate form is used to condense gold on mesial surfaces and margins — at the cervical margin a thin steel spatula may be found useful for burnishing. The bite is now used to form the occlusion. Remove the condensed gold, or as we term it, the matrix inlay, from the cavity, place on charcoal block which is guttered to assist in supporting the inlay in proper position, so that the mesial surface will be uppermost.

Now place small pieces of 22k gold plate — never solder — upon the approximal contact point and, without flux, heat the mass to redness; then reduce flame to pencil point and concentrating upon the gold plate, gently brush it over this surface until the plate is absorbed into the matrix inlay, and stop. Repeat this process of applying plate and flame again and again. The flame just melts the plate and merely sweats the matrix until the entire mass is filled with the plate. The perfect filling in of inlay with plate may be tested for as follows: Heat inlay, drop in sulphuric acid and wash with soda, then heat again, when, if porous, black smoke will be emitted in a puff; if solid no smoke will escape.

The inlay is now ready for trial within the cavity when, if the work has been properly done, little finishing will be necessary. If you have failed to obtain satisfactory margins a rope of soft gold may now be wrapped around the margins of the inlay. The inlay, with additions, is now returned to the cavity and driven home. While the inlay is so placed, carefully burnish the soft gold over margins. Then remove and heat the mass, allowing the flame to be directed on center of inlay — and not on

margins — until a slight sweating of the surface is noted, then stop flame. Both inlay and additional soft gold will be found thoroughly incorporated. The addition of the soft gold, as described, is valuable even in the event of good margins in that it forms a practically pure gold margin which may be thoroughly burnished. After polishing, the inlay is ready for setting. The wood forms are again used to drive home and to burnish margins to place. The method as described may seem to be somewhat complicated, but is really extremely simple.

#### THE METHOD EPITOMIZED

The cavity, packed to form and contour, with soft gold removed to block — 22k gold plate and flame used — cheeks as bellows — when filled inlay returned to cavity, removed, polished, and set.

#### INSTRUMENTS

Lane blow-pipe, mouth controlled, charcoal block, orange-wood forms, steel spatula, with such other accessories as may be found in a dental office.

#### MATERIALS

Soft gold foils or other golds — soft gold preferred. 22k gold plate — never solder.

Dr. Brewster will demonstrate in clinic the use of gasoline blow-pipe, thus proving that the country dentist and those who have to use natural gas may use the method.

Artificial gas is the agent used, and the mouth is used as controlling bellows. The 22k gold plate is absorbed into the compressed soft gold much as a sponge takes in water, except that in the completed inlay all the porosity is filled to comparatively smooth surface contours, altering and adding but little to the surfaces previously formed.

Care must be taken not to overheat. Of course the size of the flame will be determined by the size of the inlay.

Should your plate accidentally flow onto cavity side of inlay, it may be cut out with a burr, then place over this surface a mat of soft gold, return inlay and mat to cavity, and drive home — remove from cavity and sweat to union.

The method is applicable to the making of crowns, crown and root copings, bridges, etc.

When it is impossible, on account of shape of cavity, to use soft gold as described, an intervening matrix of pure gold 3/1000 gauge may be used.

For those who use the casting method, good margins may be obtained by utilizing the rope of soft gold as previously described.

If it is desired to work from impressions and models, the method is still at your service.



Raffia grass is a very helpful assistant for holding medial and distal inlays in place while condensing. (This is also a very good polishing agent in prophylaxis and for final polishing of fillings and inlays.)

#### ADVANTAGES OF THE METHOD

The sweating method is a direct method. It is cleanly, no muss, fuss or bother with investments. The margins are so perfect and the fit is so sure that they may be considered as perfect. It is a rapid process without the sacrifice of quality for speed; more than that, a better quality is assured. All machines, expensive or otherwise, wax investments, expensive golds are entirely eliminated. At no period of the operation are you more than a single step from the cavity itself, consequently any error must be either minute or easily detected and remedied at once.

### PORCELAIN INLAYS vs. SILICATE CEMENT INLAYS.\*

By L. E. Custer, A.M., D.D.S., Dayton, Ohio.

**I**N A BROAD SENSE we are now comparing the relative value of two agents which have been introduced into dental practice for esthetic purposes. Porcelain has been used for twenty-five years, and this period of time should be a sufficient test as to its merits, more especially its durability. The silicates have only been used a short time comparatively, and the question of durability and maintenance of color can only be approximated. The term esthetic, when used with porcelain and silicate fillings, means not only harmony of color, but in the filling's entire setting and appearance an approach to the unbroken natural tooth.

The first point to be considered is that of cavity preparation. The methods for the cemented inlay are radically different from the silicate. The porcelain inlay requires a cavity with parallel walls. There must be no undercuts and there must be perfect access to the cavity so that the inlay can be inserted in one piece. This means not only more loss of tooth material, but in many cases a separation of the teeth. There are points against the baked inlay. On the other hand, the silicate filling, being worked like a cement, requires but little more than the removal of the decay. The first silicates were not adhesive to tooth structure. This necessitated a form of cavity like that for metal fillings, but the silicates of today possess marked adhesive property. This is especially true of Schoenbeck's. The cavity preparation is therefore much easier for the silicate and, being plastic, it can be worked into intricate cavities without enlarging. It is a strong point in favor of the silicate that it requires less loss of tooth structure for its insertion. We would, therefore, score a point in favor of the silicate in cavity preparation.

\*Read before the Ohio State Dental Society, 1911.

The comparative ease of manipulation and insertion of these two materials needs only to be touched upon. Every porcelain worker knows the difficulties that accompany the formation of the matrix to the cavity; he is also aware of the extreme care that must be exercised from the beginning to the very end; he is also aware of the many technicalities that beset his way, the failure of any one of which ruins the final product. And then at the end, if his bakings have all been at the proper heat and the color matches at the last, it may all be lost when set with cement. These are some of the difficulties that attend the making of a porcelain inlay, to say nothing of the large amount of time required. On the other hand, the silicates being worked like a cement, are easy of manipulation. The perfect matching of color as one goes along can be most easily done in the mix by having the fundamental shades at hand. It has been my practice to use but two or three extreme colors of each make of silicate manufacture. If the tooth is yellow, I lay out a dark yellow and a white powder. A little experience teaches what proportion of each will give the desired shade. As the mix progresses the shade can be easily modified by drawing in a little more of the white or yellow until an exact match has been secured. Then comes the crowning satisfaction, when the filling is made, of seeing a marked harmony of color with which there has been no speculation, and no cement line. We should, therefore, credit the silicate filling with being easier to manipulate, requiring much less time, and as being more certain of a satisfactory color.

This brings us to the fourth point of comparison, namely, harmony of color. Inasmuch as natural appearance is the chief aim in using both of these materials, this will be treated a little more fully. The porcelain inlay has always been handicapped by the cement problem. It has been the experience of every porcelain worker that a perfectly matched filling, before setting, does not match after setting. The dentist has found that cement acts as a curtain between the tooth and the filling, and this shadow effect can only be partially overcome by experience. He finds it necessary to make approximal fillings in the anterior teeth of a lighter color than would match the tooth before setting and even then these, as with all such fillings, become lighter or darker, depending upon the direction from which the light comes.

The porcelain inlay, although never in perfect harmony of color, was fairly satisfactory until the improved silicate came into use; then by contrast we became dissatisfied, for one of the principal features of the silicate filling is the harmony of color that can be so easily secured. I have seen silicate fillings that defied detection by the eye. It was not until an instrument was passed over the surface that they could be detected. This cannot be said of any porcelain filling that I have ever seen. The porcelain may have matched most perfectly in color, but there was always the tell-tale cement line that can never be erased until we get a translucent cement. The nearest approach today is a porcelain filling set with a silicate cement,

this method, however, while giving most pleasing results at first, later on shows the silicate cement to be washing out more rapidly than would phosphate of zinc. This is due to the fact that the silicate must be mixed so thin when used for this purpose that it lacks durability. I should emphasize the point made by Dr. Thompson of Chicago, who pointed out the fact that a regular outline makes it more noticeable than does an irregular outline. A regular outline is necessary with porcelain, which is a point against it, whereas an irregular outline may be used with the silicate, which further conceals the same.

The first silicates that came upon the market showed a marked tendency toward discoloration. What was known as Translux often became a dark slate color in a short time. This fault led to my discontinuing its use. I was also using Ascher's at the same time, and while it was less liable to change color, I also discontinued its use. In 1908, while attending the International Dental Congress, the virtues of Schoenbeck's silicate, so extensively used in Germany, were so impressed upon me that I took up its use in September of that year. My records show a great many fillings made of this material during 1908-1909, and I can say that no more change of color has come in these fillings than would have come in porcelain fillings. When porcelain fillings change color it is usually toward a lighter shade, whereas the silicate becomes darker. Change of color in porcelain is probably due to its imperfect baking. Dr. Capon, a porcelain operator of long experience, is of the same opinion. The change in the silicates is probably due to its absorption of coloring matter, due to its porosity. My later experience with Phena Kit and De Trey's Synthetic, although covering less than a year's duration, points to results equal to the Schoenbeck in point of retention of color.

It may be recalled that at the meeting of the National Dental Association I made the statement that the longer a porcelain filling lasts the worse it looks. Two facts were pointed out as the cause of this. One was the chipping of the brittle margins in exposed positions, leaving a wider cement line which becomes still more noticeable by discoloration, and the other was the gradual change of color in many of these fillings. This change of color is usually one towards a lighter shade; the porcelain appears to lose its coloring matter — it has bleached. It was hard to believe that a material possessing the physical properties of porcelain should change color in time, but the discrepancy of color which I have seen in many cases shows to an observing eye that this material does change color in time. This bleaching of color, as I have observed it, only takes place in porcelain baked in a matrix. Storer How Inlays, which are ready baked and which I have been using for twenty-four years, show no change of color.

Summing up the question of harmony of color, my own experience leads me to the belief that, all things considered, the improved silicates give better results than do porcelain inlays. This is due largely to the



fact that there is no cement line, that there is a gradual blending of one color into the other. I should again emphasize the point made by Dr. Thompson, that a regular outline of a filling makes it more noticeable than does an irregular outline. A regular outline is necessary with the porcelain which is against it, whereas an irregular outline may be used with the silicate which further conceals the same.

The sixth point for comparison is durability. While all the preceding points have been in favor of the silicate, we now have to consider one of the most vital and upon which the future of the porcelain filling will stand unless the silicate reaches that standard that it can be called a permanent filling. As stated at the outset, the durability of the silicate has not had sufficient time for a full test, and we can only judge of it approximately. The silicate possesses some peculiar features and every day brings out some new one, the most striking of which is the apparent increase of surface bulging, as I would call it. Fillings placed in cervical positions, where abrasion is but slight, appear after a time to more than fill the cavity. I have from time to time dressed down these fillings to a level with the enamel margin. It is not claimed for the silicate filling that it will withstand hard usage, but I have come to the conclusion that it resists mastication better than a phosphate of zinc filling. And still another point, I have never seen what I would call chemical solution of a silicate filling. In other words, it stands at cervical and deep-seated approximal positions equal to any so-called permanent filling. In short, the silicate filling is not affected by chemical agents as found in the mouth, and only loses substance by mechanical abrasion. It is not affected by direct impact, but the motion must be sliding in character. When this material is used in crown cavities of the molars, especially in children, it serves much better than phosphate of zinc.

In conclusion, the practical lesson to be learned from this is the same that should prevail in all our practice, and that is knowing the properties of each material and the mouth conditions, it should be one of selection. Porcelain possesses properties quite unlike the silicates. The physical properties of these two materials are quite unlike. Porcelain, when used in bulk, withstands the force of mastication. Thin veneers and small fillings, all things considered, are better made of silicate. To be more explicit, large crown and approximal cavities and corners of the incisor teeth are more effectually treated with porcelain, whereas small mesial and distal cavities and cervical cavities of the teeth are more successfully treated with the silicates.

The writer of a paper of this kind is prone to discuss the subject purely from the dentist's side, or rather from a theoretical point of view, but we should bear in mind that the patient's interests are the more important. In other words, our theories amount to nothing unless they become practical. In some cases economy to the patient may be a factor. In other cases, time or amount of pain may be a factor which over-balance one way or the other when the conditions are about equal.

Porcelain has stood the test of time and proven its worth as a filling material and will always be classed as a permanent filling of good aesthetic properties. While this is true of porcelain, the silicates, by reason of their ease of manipulation and superior aesthetic properties, merit our careful and cautious use, and we are confident that the improvements which are sure to come in the material will in time place it among the so-called permanent fillings.

DR. WESTON A. PRICE, Cleveland: There are two or three phases of this question I am very much interested in. In regard to the paper by Dr. Douglas, "Cast Gold Inlays versus Gold Fillings," I believe we have come to the time in our experience that we can say of the inlay that it is no longer an experiment. I frequently have seen gold inlays that have been in over ten years, carrying the end of a bridge, and I simply mention this to emphasize the fact that they have had more than the ordinary strain that would come on a filling and yet they have not broken or loosened. Not only has the attachment not broken, but there has been no recurrence of decay, and I question if any amount of malleting on a gold filling could have produced one that would have withstood the strain that these inlays have. Whether or not, it is a question in our minds which filling we will use in a particular cavity, I think the success or failure will always be answered by the personal equation; and the successful method of making it will also depend upon the personal equation. I am not a prophet, nor the son of a prophet, nor the seventh son of my father, though he had six; however, I will make this prophecy, that inside of ten years casting will almost have ceased to be a part of operative dentistry. I have said this before, and some have laughed at me. I have very strong convictions that this is a truism. However, I believe that at present we have no better method than casting for making the bases for porcelain crowns, and possibly for certain classes of sectional removable bridgework, but for inlays I am convinced in my own mind that the fusing method will supersede the casting very quickly, and I hope in your hands by some such method as Dr. Barnes has suggested, or a simpler method (this method is not the most easy one for me). For the study of the problems involved in making the choice between the fused gold inlay and the cast one, we must look at once to the physical properties of the pure gold inlays. Cast pure gold before burnishing is not much stronger than lead, and unless we cast an inlay of soft gold its margins are not pliable enough to flow under the finishing stone to the margins of the cavity to close the joint and make up for the contraction that we cannot entirely control by any form of manipulation and then allow us to make a perfect joint. I am taking for granted that our standard for any form of inlay work will be such that will demand of all our work that no cement line can be found at any point around the margin of any inlay. I repeat, that to make such a margin we must have a metal that will flow under the burnisher and under the spinning-wheel, or the stone that we use to finish the inlay with. A gold solder or a gold alloyed with anything but platinum will not flow, in the sense that pure gold or platinum or platinum and gold flow. You know that you can take a piece of pure gold and cut it and the chips that turn up will stick to one another and will follow right along and become a part of the mass just as perfectly as though you were to subject the gold to heat. That can be done only with gold or gold and platinum. The disadvantages of the pure gold inlay are chiefly its weakness, not only for margins at cavo-surface angles, but for its retention in the occlusal steps unless excessive tooth structure is sacrificed. That weakness can be overcome in two ways, by putting a threaded iridio-platinum bar into the mass of gold and also, and better, by putting platinum into it. An alloy of platinum with gold is so much stronger that it is in every way preferable as regards anchorage strength and marginal strength. As to the technic that you will use, it resolves itself into the question of taking an impression of the cavity, and whether you do that with a matrix

or gold pellets or do it with the wax impression, I care not, though I prefer the latter. You may also make an amalgam model of the tooth, but by whatever method you make your impression you must be sure that the cavity preparation is always such that will permit you to reproduce that tooth, and right there is where probably 50 per cent of the errors are made, because cavities are not prepared so that any form of a matrix or impression can be withdrawn without distortion. It is one of the established principles in cavity preparation that we must protect the enamel rods forming the margin. In other words, we bevel all margins for their protection with gold. I want to emphasize this point, which is so often overlooked, viz: the preparation of a cavity for an inlay is not identical with the preparation of a cavity for a malleted filling. If we go back to the fundamental reasons for the malleted filling, we find that there is no other reason for the beveled edges than the protection of those enamel rods. But that is not the only reason for which we should bevel the margin when we make an inlay. The other reason also depends upon a fixed condition, which is the strength and pliability and flowing quality of the material with which we close the joint. Hence for an inlay we should have a wider bevel than for a malleted filling.

Now, granting that we have an accurate impression of the cavity, having had in mind when preparing it that every margin of every cavity, and particularly cervical margins, must be beveled, we may reproduce it in artificial stone, fusible metal or in amalgam, whatever you wish, and the next problem will be the restoration of your contours.

We have been doing that with casting and the procedure involves much time regardless of the method of casting, the mixing of the investments, its setting, its slow drying, and the melting of the gold, etc., aside from the errors that may have crept into those steps, make the time factor in the cast inlay method a great consideration, amounting to a positive disadvantage for the casting method as compared with the fusing method.

My experience in testing the strength of fillings with and without reinforcing them in the occlusal step has brought me to this conclusion, viz: that if from 2 to 5 per cent of platinum is used in gold, it will add 20 per cent to the strength of the gold without taking from the quality of flowing under the spinning stone finisher. Now, as to the best means of making the alloy of platinum. We may melt the platinum in the gold and cast as we have been doing, but with disadvantage as to time. Instead of alloying the gold with platinum, we may platinize gold foil or fibre and produce an alloy of gold and platinum with a melting point considerably above that of pure gold, and into which pure gold may be flowed with a blow pipe just as water runs into a sponge, almost as Dr. Barnes suggested, by flowing the plate into pure gold, except that we get a much greater distance between the melting points. A great advantage is that we have a much tougher margin than you will get with the 22 karat plate. If we use silver or copper, which are the usual alloys used in gold to make plates, we have immediately destroyed cohesive property of the gold, and it will not flow as pure gold and alloys of gold and platinum will flow; therefore, the advantage of the gold and platinum over the method he suggests comes in at once. I would suggest in his technique the substitution of the platinized gold foil instead of the pure gold, and flow into it pure gold instead of a gold alloy, with silver and copper.

The technique for making the platinized gold is very simple.

Pour over any form of pure gold fibre, wool, moss, pellets or foil (a shredded pure gold is preferable) a 5 to 10 per cent solution of platinum-chloride sufficient to dampen or wet all surfaces and pour or squeeze off the excess. Next pour over it a solution of ammonium-chloride and flow it through the mass a time or two to precipitate the platinum-chlorid as platinum-ammonium chlorid which forms a yellow precipitate over the surfaces of the gold. Take the water out of the mass by slowly heating or preferably by washing with alcohol. Then heat to a dull red, which changes the yellow platinum-ammonium chlorid on the surfaces of the gold to amorphous spongy pure



platinum, which combines with the gold when heated to a red heat, forming a gold and platinum compound.

The advantages of a shredded gold over a foil or pellets is that the former will not curl and warp away from the margins by the gold flowing on its surfaces, which the foil and pellets when used in this way will do. The platinized, shredded gold draws the pure gold into its mass around all sides of each fibre, thus preventing the curling.

To thread the gold the author feeds part of a book of No. 4 coil through a cutter on the lathe, which cuts up the gold and paper into shreds or strips. We then set fire to the paper and have the gold, which is really shredded gold, as a soft wool, we pour over that the chemicals and have a quantity in a few minutes. I would like to emphasize the advantage of inlays made of this gold over any alloy of gold other than platinum. I firmly believe that the best inlays we can make today, that is, the inlays having the greatest strength for the step and margins, the most perfectly closed margins of all alloys of pure gold, the greatest ease in seating accurately due to clearance and freedom from pimples and distortions from casting and with the least investment of time with greatest ease and simplicity in making, also greatest comfort and ease in polishing, can be made by a fusing method, and of all fusing methods that by reproducing the cavity and contiguous parts of the tooth and adjoining tooth in a hard model material which itself will withstand the temperature required without distortion and with which the inlay will be moulded and contoured in a platinized shredded gold or gold foil and into which pure gold is flowed. The edge strength of the margin is many times stronger than that of pure gold. The inlay is easily and accurately polished in this model and can be easily removed without breaking the model, which cast inlays seldom can. Fusible metal and amalgam models do not permit of melting the gold directly into their cavities. Such a hard model material is found in the special silicate cement or artificial stone suggested by the speaker. The time required is less than half that for the casting method, and the results reach a much higher ideal.

#### DISCUSSION OF SYMPOSIUM PAPERS BY DRS. DOUGLAS, BARNES AND CUSTER

DR. H. T. SMITH, Cincinnati, O.: There are one or two points in this symposium that have not been mentioned and that may be of interest. One is the classification of these fillings, dividing them into the cemented or adhesive fillings as compared with the uncemented or foil fillings. All the fillings that were mentioned, with the exception of the foil fillings, are cemented fillings, depending partially upon the cement for their retention, and it is a question not always as between the porcelain filling and the gold inlay, or the gold inlay made by casting as compared with the gold inlay by the sweating process, but the cemented filling as compared with the foil filling, adapted to the walls of the cavity by manipulative measures. There is much to be said in making these comparisons and the experiments rather indicate that there are distinct advantages in the cemented fillings, so far as its lasting qualities are concerned. In the sweated fillings which are mentioned by Dr. Barnes, and the technique of which is most beautifully brought out, and also in the technique recommended by Dr. Price, there is one disadvantage, that of not being able to carve with facility undercuts and reliefs upon the cavity surface of the wax model, which is quite easily done in the ordinary cast filling. We all admit the advantages of carving the wax models of filling with the Roach Carver, for the purpose of retention, or for protection of the pulp nearly exposed. In the comparison of the silicious filling, as Dr. Ames calls it, with the porcelain filling, I was surprised and disappointed to find Dr. Custer, an old porcelain worker, has so little to say about the advantages of the latter. I do not know of anybody, however, who states his points more concisely than Dr. Custer does, and he evidently recognizes the possibility of silicious fillings at some time taking the place of porcelain fillings. Silicious fillings, in my observation, have a distinct disadvantage as compared with porcelain fillings in some positions in the mouth. In mouths where the upper lip is short and where the silicious filling is brought down to the incisal edge,

there is a tendency for the filling to become dry—to lose its salivary moisture and, in a pronounced degree, its translucency. Well-baked porcelain fillings do not suffer from this disadvantage and possess others in durability and strength. These are the two or three points that occurred to me as the interesting papers were read.

A MEMBER: I want to ask a question in regard to the silicate cement. I have had some experience with it and I have had all of the discouragement that has been mentioned. Dr. Ames has suggested the application of heat, now for his setting of it. Now, one of the difficulties that I have had is that that material sets so fast that it is very difficult to have it in an inlay. I would like to ask if it would be any detriment to mix it on a very cold slab to retard the setting, and then apply the heat afterwards. Will somebody tell me?

DR. FLETCHER: I would like to ask Dr. Barnes how he lifts this gold out of the cavities, supposing you have a deep cavity.

DR. BARNES: Very often this is done by teasing or inserting a very fine instrument into the body of the pure gold and gently lifting, just about as you would take a cork out of a bottle, so as not to injure the cork. The small pit must be filled with pure gold, however, or a pit will remain, as the 22k gold follows only the line of pure gold.

DR. CALLAHAN: Here is an idea I got from Dr. Barnes himself, and he has failed to mention it. There is some trouble for you to get back the gold into the cavity, as Dr. Barnes has suggested, with the steel pin in lifting it out of the cavity. He speaks of teasing it out, which is very slow business sometimes and oftentimes we will bend the matrix. If you will lift the gold matrix out of the cavity and put a little piece of fine hair platinum wire down into the cavity and melt just a little bit of gold to that, then you can put this inlay in and out of the cavity; the patient can bite against it if they want to, you can still raise it up, and it is not in your way. This you keep as a handle to lift it in and out, and it will facilitate matters very much.

DR. BARNES: Dr. Callahan has given the technic for the pure gold burnished matrix. It is applicable, however, to the soft gold by pushing the end of the platinum into the body of the gold and packing around it. A narrow piece of 22k plate or of pure gold may be used as well. If the 22k plate is used it will be infused into the body of the inlay.

DR. DOUGLAS: In regard to Dr. Price's prophecy, that in ten years from now the cast gold inlay would be obsolete, I will say that I hope his prophecy will come true, for this reason: if at that time we have some method which will be so much better that we can *afford* to discard the cast method, we will have something that much nearer an ideal filling.

DR. HENRY BARNES, Cleveland (closing): The weakness of the inlay is in the marginal edge, and the paper contends that the infused inlay, re-enforced with soft gold around its margin and sweated to union with the body of the inlay, gives a practically pure gold margin which may be burnished to place.

Soft gold foil is used because it affords the best adaptation to the walls of the cavity, and when well condensed by aid of the orange-wood points, the fit is perfect. Cohesive foil is not, when enmasse, so easily adaptable. Moss fibre is difficult to dislodge, as it breaks during removal.

The platinum and gold, of which Dr. Price has spoken, I have not used. Dr. Price claims for this greater edge strength. The soft foil, because of its perfect adaptation and when infused with 22k plate, will produce an edge impossible to make with any gold when heated to the molten stage and cast, or even when contained within an investment material and heated therein. With the infused inlay, without investment, there is no change of form of the original matrix gold, while the molten gold does change from the original form as obtained from the cavity, and the nearer our work is to the

cavity the more perfect will be the result, because the more steps taken the greater the chance for failure.

I wish to assure Dr. Ames that the time actually spent in infusing the gold within the matrix varies from one to two minutes for small cases, and not more than ten minutes for large ones. We are all under very great obligations to Dr. Ames, for if he was not the pioneer, he was a pioneer in inlay work, and at a time when it took courage to proclaim one's faith in this class of work. He endured the rebuffs and took the scorn meted out to those whose convictions have made it possible for us to do that which is being done in this field.

Dr. Callahan very kindly acknowledges his obligation to those of us who have tried to better the inlay, and I thank him for this, but we are all under obligations to those who have so cheerfully given of their knowledge that we might improve. I never enter a pulp canal, with that apical third of the pulp so difficult to remove, that I do not fervently say "God bless Callahan for sulphuric acid."

Dr. Smith has called attention to the hollow inlay. I prefer an inlay which has little cement between it and the cavity wall. If you wish, the cement may be placed in the cavity first and then prepared in such a way that you have, when the inlay is placed in position, practically a hollow inlay. In all cases requiring a large body of cement, I first apply carbolic acid to the cavity, warm with heated air, then use a thin film of Canada balsam, which seems to prevent the pulpal irritation, due to the presence of the cement.

I am a little disappointed because there has been no discussion which might be construed as against the principles noted in the paper, because there are so many items not possible to note in a short paper, which a discussion of this character would have brought to our attention. I fully expected some one to take me to task for calling the method the "sweating method." Strictly speaking, it is not "sweating," but for want of a better term this was used. I had hoped to have some one suggest a more appropriate term.

NOTE: I have, since the meeting, had the term "infused" offered by Dr. Rauh of Cincinnati. This seems to be a very good name, for that is precisely what takes place when the 22k gold is infused under the flame when it sinks into the body of the pure gold.

DR. J. K. DOUGLAS, Sandusky (closing): I will say in regard to what Dr. Price mentioned here, that he prophesies that the cast inlay will be out of date in ten years, I hope it will, because in ten years from now it will be no good. If we can afford to make the cast inlay, I believe that once filling a tooth will be all that is necessary.

DR. L. E. CUSTER, Dayton (closing): We have been especially favored today in having with us Dr. Ames, for if there is any one man in our dental profession that knows anything about cements or silicious cements it is Dr. Ames. There is no one man who will tell you more of the secrets which properly belong to the manufacturer than Dr. Ames, and I am especially glad of having a few words of conversation with him in regard to his view of the cause of bulging fillings, and I believe he is correct, and more care should be used along that line, because those that I have seen have always been cervical cavities in which, notwithstanding all the care I could take, there has sometimes been a leakage of moisture, due to difficulty in keeping it dry during the insertion, or perhaps in sealing it over with varnish or paraffine afterwards, and which did not find its way up under the gum. It has been my method to touch the gum at the margin with about 20 per cent solution of trichloric acid, and that will effectually stop all weeping of the gum and give you plenty of time for the making of the filling, but likely I have been lax in the use of the varnish afterwards.

He also gave us his opinion as to the cause of discoloration, for which we are under obligations. I purposely mentioned the names of manufacturers, and I am glad I was supported in that, because if there is anything that is unsatisfactory about a paper it



is that a man should refer to certain articles of a certain manufacturer without mentioning the name, and finally we go to the man in the hotel lobby and he will tell you all about it. What is the use of all that foolishness? Dr. Smith called attention to the fact that I have not paid sufficient attention to porcelain in the paper. My answer for doing so is that I know we are all pretty well familiar with porcelain, and that the time would be more usefully given to silicates. I do not advise that the silicate cement should be used on the corner of a tooth, where it would be subjected to a sliding motion in mastication. I called attention to that, one place in the paper, that it is thought that the wearing effect upon a filling is due to a sliding motion, and therefore it should not be used on any part of the teeth where it will be subjected to any such friction. Direct impact does not affect these fillings.

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## NITROUS OXID AND OXYGEN ANESTHESIA.

By Alfred Hall, D. D. S., Chicago, Ill.

THE subject of anesthesia is a most interesting one, for the reason that so little is known concerning it. There is no branch of medicine or dentistry in which so many of us are so vitally interested, and at the same time in which so little progress has been made.

The combination of nitrous oxid and oxygen has engaged the attention of scientists for a number of years, and today greater interest is aroused in its development than ever before. It is of comparatively recent date that apparatus has been nearly perfected for scientifically combining, warming and administering these gases. I say nearly perfected because I do not believe that apparatus such as have been invented, the operation of which requires the services of an assistant, is all that can be desired. Everyone thinks he can administer an anesthetic, and yet there is no art that requires such constant practice in order to attain perfection.

Owing to the fact that the elementary constituents of nitrous oxid are bound together in chemical union, this gas is not broken up into its original elements when absorbed by the blood. It is inhaled as nitrous oxid and exhaled absolutely unchanged, consequently the value of pure nitrous oxid as an anesthetic is limited to operations of an instantaneous nature. The induction period of anesthesia is twenty seconds to two minutes, and the workable anesthesia resulting from a single inhalation period, lasting only fifteen to forty-five seconds.

If nitrous oxid be administered in combination with pure oxygen and the supply and pressure be carefully regulated, the most profound anesthesia associated with normal circulation and respiration results. The anesthesia may thus be maintained with perfect tranquility and safety sufficiently long to perform any surgical operation.

It is my practice to administer oxygen with nitrous oxid even if only for the extraction of one tooth. This combination is much pleasanter to inhale, prevents cyanosis, produces less after effects, and prolongs the period of workable anesthesia, thus minimizing the liability of laceration.

## PHYSIOLOGICAL ACTION

Under nitrous oxid anesthesia, the respiration is deeper and quicker than normal; the pulse becomes fuller and may increase in rapidity so as reach 110 or even 160 per minute; the pulsations, however, are somewhat slower in profound anesthesia but remain full. The pupils usually become widely dilated when complete anesthesia is attained, but this phenomenon is not absolutely constant. The senses of a person passing under the influence of nitrous oxid are at first rendered somewhat more acute, after which follows a condition of analgesia and a few seconds later profound anesthesia ensues.

To produce a prolonged nitrous oxid and oxygen anesthesia, free from muscular spasm, and as smooth and tranquil as that produced by any other anesthetic, it is necessary to eliminate cyanosis and all other evidences of asphyxia, a thing more easily said than done. I therefore offer a few suggestions, which, if followed carefully and technically, will make possible such an anesthesia:

*First*—Have a continuous flow of both nitrous oxid and oxygen under positive pressure.

*Second*—Use warm gases, as a more tranquil anesthesia will be induced and there will be no post operative bronchitis or pneumonia.

*Third*—Maintain depth and character of anesthesia, not by turning off and on the nitrous oxid, but by regulating the supply of oxygen.

*Fourth*—Watch your patient closely and learn to anticipate symptoms.

When it is taken into consideration that the patient recovers from this anesthetic immediately, regardless of the time he has been under its influence, that there are no after effects either upon the lungs or kidneys, that it can be given safely to patients who could not live under ether or chloroform, is it to be wondered at that nitrous oxid and oxygen anesthesia is growing in favor? Scientists are slow to adopt new methods, but it is the opinion of nitrous oxid and oxygen experts that in the near future this form of anesthesia will be given preference in all of our hospitals.

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THE DIGNITY OF SERVICE.\*

By Horace M. Thomson, D. D. S., Indianapolis, Ind.

LOOKING forward to old age with what feelings we may, one fact is obvious — no matter what we think about it, we are in for it; no matter how much we may dread its approach, yet it is a stage in life we all hope to reach. The problem before us is, how can we make old age an asset instead of a liability? It should be the sunny side of life, not the proverbial shady side. Poverty is bad enough at any time, but an old age unprovided for is a tragedy. Almost any man can — if he has the ability to deny himself present luxuries for future good — attain a decent competency. However, the practice of niggardly economy dwarfs the soul.

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\*Read before the Cincinnati Dental Society, 1911.

Of professional men much is expected, and rightly so. We cannot claim a divine call for the profession of dentistry, but in choosing the professional life we should be spurred on by the highest ideal of the possibilities for good in the practice of our profession. Our great American essayist, in his essay on "Compensation," says:

"Do the thing, and you shall have the power; but they who do not do the thing have not the power."

"Human labor, through all its forms from the sharpening of a stake to the construction of a city or an epic, is one immense illustration of the perfect compensation of the universe. Everywhere and always this law is sublime. The absolute balance of Give and Take, the doctrine that everything has its price, and if that price is not paid, not that thing but something else is obtained, and that it is impossible to get anything without its price. If this be true, then we will get out of our life just what will compensate us for what we have put in it. Think opulent thoughts and you will be prosperous."

As professional men, we are entitled to a decent home in a respectable neighborhood in which to rear our families. Obviously, we must read good books and be able to meet the people we wish to know on an equal footing — and if we are to keep what Mr. Roosevelt calls the keen fighting edge we all feel so essential, we must have periods of relaxation of several weeks in summer and shorter times during the year. Most men seem to be dissatisfied with their occupation in life and fondly hug the delusion that if they had only done something else they would have been a Marshall Field of commerce or a Napoleon of war. The real, brutal truth is that if we are failures at our present avocation, we would have been a failure at whatever we would have undertaken. Failure and success are inherent in us, not in the work we are doing. If we are successful, it is fair to assume if we had entered a field of larger opportunity our success would have been greater than it is. Also had the opportunity been larger our failure would have been more apparent. Let us be glad it is no worse.

He must be a genius at stupidity who, on reading the dental literature of the past year, would fail to observe that the average dentist is hard up. The average dentist is just an average man. The notion that we are all born free and equal is a dream that can never come true. We are not born free, for we are all hedged about by circumstances over which we have no control — poor relations, for instance. We are not born equal — not if we are twins. We are all incredibly complex, not being equal mentally, physically or morally. No two of us ever see the same thing from the same angle. What might be an ideal to a dreamer would be to a so-called practical man an incredible folly. The only time we can hope to be free and equal will be after we are dead, and that will be too late to be of much satisfaction to us.

We are all bound to be self-made men to a greater or less extent. A self-made man is usually one who has started in life with a hindrance of some kind — frequently lack of education — and by industry, honesty and



energy has risen to an enviable position in his community — either financially or intellectually, or both. But in our admiration for this self-made man it will be profitable for us to remember the drunkard in the gutter and the prisoner behind the bars, who are no less frequently self-made men than he whom we delight to honor.

Dentistry — and by dentistry I mean modern dentistry dating from the founding of the first dental college in the United States — has always worn a hobble skirt. Every graduate in dentistry has been more or less handicapped by the methods of education. Any movement for the elevation of the profession, if it succeeds, must be the result of the concerted action of at least a respectable minority of the representative members. Certainly a man here and there who raises his fees fifty per cent can have but small influence in bettering the condition of his confreres; but half a dozen among an hundred who get a better conception of the dignity of service may be the “leaven that will leaven the whole loaf.” A man of any value in the world is a servant. He may serve one or many, but the man who is not a servant is about as useful to society as the hole in the doughnut is valuable as food. Now, dignity is not pomposity. The heads of wheat that stand up the straightest at harvest time are those that have nothing in them. We dignify service when we make it *honorable* and *respected*. Then let us take our work seriously. The occasion does not call for wit, and if it did Sydney Smith says there is not one chance in a million that we have any. The relation of the physician and the dentist to their patients is a peculiarly confidential one. On the part of the patient, it generally involves their confidence as well as that of the person recommending them to you, and you have a perfect right to expect that they will place themselves in your hands with the full confidence that you will give them the best treatment you are capable of. Are we fulfilling our contract to the letter? When we fully comprehend and understand the *dignity* of service, the question of *compensation will take care of itself* and we will not demand a *larger* fee than our poor patient can afford to pay, or accept from our more affluent client less than we think our services are worth.

An ancient philosopher — convalescent, no doubt, from an attack of typhoid fever — feelingly remarked that the stream flowing from the spring could not be pure if the spring was contaminated. Also a distinguished Catholic prelate said that if he could have charge of the religious education of the child for the first seven years of its life, he did not fear for any influences that might be brought to bear later. Now, the spring from which floweth the water of professional duty is the college; also the student is a child just born, in his conception of what professional duty is, and it is the work of the college to do in three years what the Catholic priest said would take seven — get your child so perfectly grounded that any influence that may be brought to bear later will be of no effect. Are our colleges teaching, by precept and example, all they should teach? Em-

phatically, no! The whole system of dental education could hardly be more cunningly devised to destroy the professional spirit, if it existed, and the first and greatest duty of the college should be to develop it.

Probably the majority of the contributions to our current literature that are worth reading are written by college men, and so far as I know there never has been a work of any considerable magnitude that was not written by an active college teacher. The advanced position of the college, requiring three years of attendance on lectures before granting a degree, is the result of the efforts of the colleges themselves, though the state law requiring an examination and a diploma from a recognized school has no doubt had a salutary effect on the college and students as well.

So far as I know, all educational institutions in all states are exempt from taxation, the idea being that they exist for the state, are a benefit to the state, and are not supposed to be money-making concerns. Their revenue is supposed to be expended for the benefit of the student, therefore they are not burdened with taxation.

It was a great misfortune that the *first* dental colleges were privately owned affairs. No doubt the ideal dental college would be one owned by one man who had the highest ideals and appreciation of the possibilities that could be attained, just as the ideal civil government is the absolute monarchy — if you can always get an ideal monarch. However, absolute monarchies among civilized people are becoming rare. Even the Russian Czar has within the last few weeks had his wings clipped; the King of Portugal has taken up his residence in England, for his health, and Alphonso is a living example of the fact that “uneasy rests the head that wears a crown.”

The accident that brought the *first* dental college into being was the refusal of the Maryland University to establish a dental department at the request of Dr. Chapin A. Harris, because “the subject of dentistry was of little consequence.” The day the Baltimore College was established was a sad day for us as far as our professional standing is concerned, for no matter what we may think of the establishing of dentistry as a separate profession from medicine in relation to our attainments as a profession, we would undoubtedly have had a better standing with the laity had we been content to have taken our M. D. degree and specialized afterward.

A privately owned dental college is wrong in principle and liable to be vicious in practice. Dentistry should be taught either in state universities or endowed colleges. The privately owned college is always open to the charge of being conducted to put money in someone's purse. It can never have the loyal support of its alumni or the respect of the profession that an endowed college or a state university would have. The temptation is too great to cut equipment, practice poor economies to show a profit at the end of the year. Every student has a moral if not a legal right to demand that every dollar he pays into the treasury shall be spent to prepare him for the practice of the profession. Does any one of you imagine the Chicago University would, in the few years of its existence, have taken

the position it has among our institutions of learning if it had been established as a branch of the Standard Oil Company and was now on a dividend-paying basis? Or that the graduates of Harvard College all over the world would be as wildly enthusiastic about their alma mater if Professor Eliot had owned the college and had, on retiring, sold his stock to Professor Lowell? The privately owned dental college may have been necessary in its day — it was never more than a means to an end; it has served its purpose and is passing.

When the Baltimore College was established, or soon after, the habit was formed of paying salaries to lecturers and demonstrators, thus limiting the teaching force to far too few men for the benefit of the student and college as well. In some of our great medical schools, I understand, none of the teachers draw salaries, and in all of them a money consideration for teaching is the *exception* rather than the rule, only a few of the special lecturers and laboratory men being paid. In dental schools everybody connected with the school, from the janitor to the dean, draws a monthly stipend. There are some things to be learned that are more desirable and more difficult than those things set down in books. Among the greatest advantages enjoyed by the medical student is his intimate daily contact with his lecturers, who are frequently the clinicians as well, and who are almost without exception representative men in their respective specialties. These teachers are giving their best efforts to the students, not begrudging the time, because the student's opportunity is their opportunity. The great law of Give and Take is operating here. The damning thread of money that runs all through the dental student's college life is almost if not entirely absent from the medical student's. The medical student can hardly fail to grasp, in some measure, the idea and get the inspiration of the dignity of service; but the dental student must be nimble-minded, indeed, if he gets even a fleeting vision of this invincible force.

Solomon was a many-sided man, and among his other accomplishments he was somewhat of a chemist, for walking in his laboratory one day he noticed an offensive odor. Looking around, he soon discovered the cause, and turning to his best apothecary said, "The dead flies in the ointment causeth it to send forth a stinking odor." Had Solomon been more of a fool he might have thought the ointment was bad. The privately owned college is not the only dead fly that is stinking up the sweet ointment of dentistry.

The first clinics were small affairs, each student securing his own patients. Later the clinics were so far commercialized that they were advertised in the public press and even the theater programs, the advertisement of the college appearing by the side of advertisements of the dental firms making the most notorious and fraudulent claims. No college has any right to resort to any means to build up a clinic that it does not expect its graduates to use after they begin practice. You cannot expect the average student to have a higher conception of ethics than is practiced by



the college of which he is a student. Better have no clinic than to destroy or fail to develop in the student's mind the dignity of service. With a corps of paid demonstrators it is impossible to charge fees in the clinic that will cover the cost of materials, which is the only fee that should be charged, and anything in excess of this should be prohibited by statute.

This is the most demoralizing part of the curriculum of the college as now constituted — the fee of the clinics. The patients think they are paying only for the cost of the material used, and the student knows this is what the patients think, and it is the most natural thing in the world for the student, after he has begun practice, to base his fees in his own mind on the materials used, and thus the demoralizing idea is born that he has something to sell other than the product of his brain, his time, and the cunning of his hands.

The homeopath believes there is a remedy for every disease, if only he can find the remedy. The remedy for these abuses is plain enough — make it impossible for any man to profit financially by owning shares of stock in our colleges. This will remove the temptation to make them show a profit and will place them above reproach. When this is done let us take the same interest in our schools that the medical men take in theirs. Let the lecture chairs be positions of honor and honor only, and we will find men resorting to all the wiles of the politician to get on the staff, just as we do now among the medical men when there is a vacancy in the faculty. Are we less selfish than our medical friends? Would we be less benefited than they if we take an active part in college work? Certainly not; but we must be less selfish, for the only reward we can have will be the consciousness of knowing that we are doing our duty to the great student body and the broadening influence that will come from our contact with the student and fellow teachers.

“There is no teaching until the pupil is brought into the same state or principle in which you are; he is you and you are he; then is a teaching, and by no unfriendly chance or bad company can he ever quite lose the benefit.” Teachers are like poets — born, not made. Just as the sweetest song is the song that has never been sung, so no doubt some of our greatest teachers are teachers who have never taught. It is a marvelous gift, this being able to teach — the ability to know a thing and still, by some queer mental process, be able to view the thing as if you didn't know it, and so be able to impart your knowledge to another. The secret of memory is getting a vivid first impression, so some men have the faculty of stating a fact or a theory so lucidly that the subject is illuminated, and you couldn't forget their teaching if you would.

When we get our college professorships on a proper basis we will find there are more teachers than we ever dreamed of, and our college faculties will be three or four times as large as they are now, and the impetus this will give to our profession will reach every village in the land. Dentistry is coming into its own; some day soon it is going to be proven that some of

the diseases the doctor cannot cure originate in the mouth and can be prevented. Every day the practice of dentistry is becoming more attractive to men of liberal education, more of this class of men are taking up the study of dentistry than ever before — and more will come when the enlightened suggestion of Dr. Byram is acted on — to give credit for work done in our literary colleges, so it will not be necessary for graduates of literary colleges to go through the same grind that second-year high school students do to reach their degree.

How are we going to conduct our clinics so they will be nothing but a benefit to the students? First, we are going to place them on a higher ethical plane; there will be no misunderstanding in the mind of the patients about what they are paying for; if the materials used cost nothing, no fee will be charged; if a dollar's worth of gold is used, they will pay a dollar. If we start at the foundation of things and build on a broad and solid rock, instead of the shifting sand as we are doing now, we will build a much fairer superstructure than we have at the present time. In the new order of things the demonstrators are going to be men who are willing and anxious to give one afternoon each week to the college clinic. Then the dental student will have the same advantage that the medical student has — the intimate contact with a large number of men who are standing for the best there is in our profession. Some of us are getting old enough to enjoy the society of young men; they need us and we need them. "As I approve of a youth that has something of the old man in him, so I am no less pleased with an old man who has something of youth. He that follows this rule may be old in body, but he never can be so in mind," is as true as when it was written many centuries ago.

But this is not all the benefit. Demonstrating in the clinic would be a continuous post-graduate course for all of us and would be of incalculable benefit to our own patients, for we all have ideas and methods we would like to see tried out, and among the patients of the clinic we can almost any day see a variety of cases that would hardly appear in our practice in five years. It is a scandal that a student can come to our college, spend three years, and on leaving not have a speaking acquaintance with a half dozen representatives of the profession other than his teachers.

We place too much value on thought and facts. Sentiment is the thing; the dreamer of dreams is the inspirer of other minds; nothing is impossible — every inspiration can be worked out. Darius Green came to grief in his flying machine, but it is conceivable that had Darius not wished to fly the Wright brothers would never have conceived and perfected their heavier-than-air craft. The submarine existed in Jules Verne's fantastic mind years before it became an accomplished fact. "Trust your emotions. In your metaphysics you have denied personality to the Deity, yet when the devout emotions of the soul come yield to them heart and life, though they clothe God with shape and color. Leave your theory as Joseph left his coat in the hand of the harlot — and flee." "A foolish consistency is the hobgoblin of little minds. \* \* \* \* Speak what you think today in

words as hard as cannon balls, and tomorrow speak what tomorrow thinks in hard words again, though it contradict everything you said today.”

The idea I have been trying to impress on you is that you will be making no sacrifice in giving up some of your time and all of your talents to help train and guide the young men who are coming into dentistry. You will reap just as surely as you sow. We have been sowing tares, hoping to reap a profitable harvest.

But, you say, what has this to do with the average dentist being hard up? It has everything to do with it. It is the great first cause. No man is poor who has the proper conception of the dignity of service. No man can ever get the proper idea, except by chance, unless he has been taught. We haven't been taught: “result, poverty.”

Nine-tenths of the unethical advertising in the dental profession today can be traced to defective teaching. About all the quackery of medicine is due to lack of character. Probably no class of men are so bankrupt of honor as the medical quack, who prey on the unfortunate, hold out hope to the hopeless, and when opportunity offers magnify a simple pathological condition into a horribly malignant one, thus terrorizing the patient and exacting an exorbitant fee for a supposed cure. Who ever heard of an irregular medical practitioner becoming an honorable one? The thing is impossible. His methods spring from a defective moral sense that forever precludes his being anything but what he is.

Among the irregular practitioners of dentistry we find a totally different class of men. The usual infraction of our code is some form of public advertising. It is no uncommon thing for these men to change their methods, become members of our societies and be moving spirits in them. A man who honestly believes he is doing no wrong is always capable of being directed into the straight and narrow way. Once convince a fair-minded man that he is building up his practice on your reputation, not his own, and he will stop. The greatest asset the advertising fraternity has in this city is the standing of the members of this Society. Obviously, if there were no ethical practitioners, then advertising would lose its advantage and we would all be on the same plane.

We are progressing, and our progress is going to be forward and not backward. We are all ready to do our duty as we see it, and certainly we have no plainer duty than to get into closer touch with this splendid body of young men who are each year coming to our colleges.

Kipling, in his recent poem published in the October number of the *American*, has expressed his idea of the standard a man should measure up to thus: The poem title is “If.”

“If you can keep your head when all about you  
Are losing theirs and blaming it on you;  
If you can trust yourself when all men doubt you,  
But make allowance for their doubting, too;



If you can wait and not be tired by waiting,  
 Or being lied about don't deal in lies,  
 Or being hated don't give way to hating,  
 And yet don't look too good, nor talk too wise:

"If you can dream and not make dreams your master;  
 If you can think—and not make thoughts your aim,  
 If you can meet with Triumph and Disaster  
 And treat those two imposters just the same,  
 If you can bear to hear the truth you've spoken  
 Twisted by knaves to make a trap for fools,  
 Or watch the things you gave your life to, broken,  
 And stoop and build 'em up with worn-out tools:

"If you can make one heap of all your winnings  
 And risk it on one turn of pitch-and-toss,  
 And lose, and start again at your beginnings  
 And never breathe a word about your loss;  
 If you can force your heart and nerve and sinew  
 To serve your turn long after they are gone,  
 And so hold on when there is nothing in you  
 Except the will which says to them: 'Hold on!'"

"If you can talk with crowds and keep your virtue,  
 Or walk with kings—nor lose the common touch,  
 If neither foes nor loving friends can hurt you,  
 If all men count with you, but none too much;  
 If you can fill the unforgiving minute  
 With sixty seconds' worth of distance run,  
 Yours is the Earth and everything that's in it,  
 And—which is more—you'll be a Man, my son!"

## DISCUSSION

DR. C. P. SWENY, Cincinnati: "The greatest results in life are usually attained by a succession of simple means and the exercise of ordinary qualities."—*Smiles*.

Those who have a definite object in view and strive conscientiously to attain this goal are usually rewarded with a successful attainment of their aims and purposes, the measure of success dependent upon the energy and concentration applied in its completion.

You who have had the experience in teaching have no doubt observed the brilliant-minded student, whose gray matter was of such a quality as to render his efforts at learning a very easy matter; by his side is a youth of mediocre talents, whose learning comes to him only by continued application. In a majority of cases the training of the latter has fitted him for more efficient service than his more intellectual mate, for he has learned the art of doing little things in a careful, methodical manner, which are the units in the superstructure for greater service.

We have but to glance at the biographies of great men to find that they owe their successes in a great measure to a succession of little things and to their indefatigable industry and application. Continuity of purpose, or effort directed along certain lines, has made many a success out of what apparently seemed would prove an ignominious failure.

Our profession has evolved from its early rudimentary condition, when the itinerant mendicant, or barber, performed the simple operations of the mouth, to its present status of a dignified calling, with many men of high intellectual aims and purposes

rendering a service to suffering humanity that is secondary to none of the learned professions. Whether or not we should have been considered a department or specialty of medicine is a mooted question and has its advocates both pro and con. Nevertheless, it does seem that the laity has a lighter appreciation for our services and standing in comparison to that of the medical man, and why is this? Is it simply from the fact that in times past a goodly portion of our work must needs be of a mechanical nature? We might say in reply, surgery, as the medical man has it, is nothing more than applied mechanics. Or is it that the rank and file of our profession are not imbued with the high purpose of our calling and are in the same solely from a mercenary reason? This might answer in some instances, but we think there are many men within our ranks who are giving their best endeavors to place the profession upon a higher level, and when this is accomplished—as it is surely being done—then can we hope to be accorded our proper recognition.

The medical man is showing us more deference, simply from the fact that we are a necessary help to him in his battle against disease, and just in proportion as we merit this recognition just as surely shall we receive it.

We have just begun to lose sight of the fact that we have been mere fillers of the cavities found in teeth, caused by decay, and restorers of lost teeth by placing in their stead artificial substitutes—rather than the prevention of decay. And this one concerted movement, *Prophylaxis*, will have more effect toward placing the profession in higher estimation by our clientele than any other one thing of recent years.

The essayist says, "Failure and success are inherent in us, not in the work we are doing." We hardly agree with him in this particular, for oftentimes environment and surroundings have a great bearing upon this feature. Many a man has taken up a vocation in which he has proven an absolute failure. A mistake in the selection of a calling—or rather a mistake of judging his talents—when later on possibly a new field is exploited and success crowns his efforts, simply because his efforts have been applied in the direction of his talents.

We agree with the essayist, in part, in regard to the dental colleges, for too many of them seem to be conducted solely for the revenue derived therefrom and apparently in the race solely for commercial purposes. Yet in the early foundation of these institutions no other plan could be resorted to. However, that day has passed, and the colleges whose efforts are still clinging to the fossils of the past are surely receiving a quieting potion or hypnotic in the way of a lessened attendance in the number of students. It seems to us that the proper place for a dental college is as a department of a university or state institution of learning. The student is there thrown into a university atmosphere, where he has access to all departments, and elective courses on the side are open to his selection and he cannot help being benefitted from this association.

In reference to the fact of the dentist being financially hard up, for the most part, we can simply reiterate what we have said upon this floor in a previous paper: The average dentist is a poor business man, and I firmly believe it is mostly through mismanagement and carelessness that this state of affairs is brought about; for very often the only estate left at his death for the benefit of his family is, perhaps, a modest insurance policy in which he was fortunate enough to invest.

It is true our incomes are somewhat circumscribed, nevertheless we can see no real reason why we should not be in an easier frame of mind over our finances, and old age be made more comfortable by the reason of our having paid more attention to correct business methods.

H. C. MATLACK: It is with fear and trembling that I attempt to discuss this paper by Dr. Thomson, when he talks of his old age; but it is certainly a source of gratitude to us all to feel that he has made good and that he will make his old age an asset and not a liability.

Does the essayist mean to infer that an increased dignity of service, a more exalted ideal, will bring about a greater financial return, a less uncertain livelihood? Does it not at first thought seem that the "hard-up dentist" will have to look to some other source other than increased dignity of service for a solution of his financial problem of living as a gentleman, and particularly a professional gentleman, with a little leisure, opportunity and environment to cultivate at least a few of the higher things of life? Our essayist of this evening has provided us all with food for thought which should and will inspire us with higher ideals for our profession; certainly the ethical side of our profession must always be the predominating factor to us and a higher standard, *the highest standard*, is the consummation devoutly to be wished; for any man who enters the dental profession with any foresight at all must take into consideration that his standing as a force, small though it may be in his community, is a large part of the asset of his profession; his livelihood being only a portion; these things are his compensation for a limited income. The youth who is not willing to view the matter in this light and who hankers after the flesh-pot should never be encouraged to take up the profession of dentistry. Therefore the essayist has taken his point well, that the ethical side of dentistry should be so thoroughly woven into the warp and woof of the dental-student-instruction that it will always be first, and the financial side a secondary consideration. These are undoubtedly compensation to the dentist for his limited income. Our friends expect of the strictly ethical practitioner not a great show of handsome houses, touring cars and jeweled and ermined wives, but that we live in decent houses, in a respectable neighborhood; that we can so order our lives that we can meet desirable patients and fellow-citizens on an equal social and intellectual footing, with no comparison whatever as to our financial standing. If a man does not esteem these things at their true value and regard them as a large part of his asset, then he will be a dissatisfied, disgruntled failure if he looks only to the financial return; for, gentlemen, rough-hew it as we may, there is no glittering financial asset to the practice of dentistry. Therefore there cannot be too much stress, too much instruction, too much example of the ethical; since this bears not an incidental relation, but is a vital part of dentistry as a livelihood. The final test of a business man's ability is the financial return, but it is no reflection whatever upon our ability as good dentists that we are not able to show large financial returns. And now I dislike very much to do it, but we must return to that rare specimen mentioned by the essayist, the "hard-up dentist." Now, if this hard-up dentist cannot make these ethical things pay his rent and educate his children, then he will have to console himself with the thought that there is only one way to regulate and reduce the over-supply of dentists; and that brings us around to the starting part again. A higher standard of dentistry, a much more comprehensive curriculum, a culling of the *too, too* many dental aspirants, a survival of the fittest, and then in those happy days there will be a decent living for conscientious members of the profession; for there will not be an over-supply, which there certainly is now.

The failures that you deemed were near,  
The trials and the tribulations—  
Calamities you'd cause to fear,  
You thought from all the indications!  
You worried early, worried late;  
The trouble would your soul appall.  
It did seem tough to contemplate,  
It never happened, though, at all.



EDUCATION AS A MEANS OF ELEVATING THE STANDARD  
OF DENTISTRY.\*

By Walter G. Merdian, D. D. S., Detroit, Mich.

THE subject on which I shall address you is: *EDUCATION* — as a Means of Elevating the Standard of Dentistry; the necessity of a preparatory course before undertaking this study; the education of not the student alone, but also his future subjects, the public; what beneficial results the State Board of Dental Examiners could effect in the education of this public, and this student; by the proper regulation of the advertiser; and the views of a clergyman, a lawyer, and a layman upon what this profession means to them, and what it needs for itself.

In assuming to address you on so important a subject as has been allotted to me tonight, I desire to state at the outset that it must be treated in an original manner, and that I approach my topic with a great deal of awe, not unmixed with reverence, for the matter is vast and amazing — vast in that the world is the arena, amazing in that its results are wonderful and far-reaching.

Man in the making, no matter in what occupation or vocation in life, should be actuated by certain principles of integrity, worth, stability and progress. It should be his purpose to bring out the qualities which he possesses, the latent powers of body and soul, to their utmost; to strive not only for the ideal, but also should at least gain that point where he uplifts — his profession in particular, and the world at large. Now, there is some spur, some motive, to all our actions, but how few of us realize to what heights these efforts of up-building may soar. Will you not agree with me when I state that there is no profession with the possibilities that dentistry possesses. You know its rise and have been a keen co-worker in its progress. Without contrasting to you, gentlemen, the period of today with that of yesterday, I may say, only, that the wheels of progress have responded to the master intellect of man, and just as they, who were the producers of these monumental wonders — held up as the Napoleons of Science — just so is the dentist abreast of his times; and in the same respect is he regarded as a master in his own field of useful endeavor. It is *he*, then, who must uplift; it is *he* to whom we look for its progress. And may I ask, Is not the man armed with education and intelligence, combined with the proper skill and mechanical ability, best equipped to bring about these results?

For it is a rank injustice to permit the student entering the dental college to start upon a career in dentistry without a good education, at least one exemplified in the graduate from our high school or college. Why? Because it is an injustice to the public, the profession, and himself. To

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\*Read before the Michigan First District Dental Society, 1911,

the public he is unjust, being so weak in theory that he cannot properly diagnose their needs; he is unjust to his profession, and himself, because he is not equipped with the proper ability to cope with the difficulties which present themselves in that profession. For skill alone does not make the good dentist; it is a combination of theory and education to guide, and mechanical ability to execute, that brings about the *best* results.

Granting, then, that the dentist has these qualifications, is not the public the proper medium for his labors in this direction? The public is like a derelict at sea, unmanned and rudderless, drifting with the tide — a master mind is needed to guide and direct it. Who, I ask, is more competent to assume the wheel than the dentist?

Gentlemen, this subject, viz: the relation of the dentist to the public, and the proper means of education in this respect is too vast to treat of in one paper. I can only bring out some salient points that pertain to it.

We notice now-a-days the interest taken in the subject of oral hygiene as taught in the public schools, and the free clinics sanctioned by our public officials. Who was the first to broach this subject, to make it possible? The dentist. Who is now propounding the need of oral prophylaxis and enlightening the patient to its beneficial effects? The dentist. Who started this world-wide movement, as potent and far-reaching as even religion, or the sciences? I answer again: the dentist.

Looking at this subject from every point of view I realize, and I think you will agree with me, that our State Board of Dental Examiners could do more to educate the public in a general, and even particular way, than even we ourselves. Look at the power they enjoy, the respect of the community, the student and the dentist show them. They are vested by law with the right to examine the graduate, to bring to trial and even convict those who do not obey the regulations prescribed. They are empowered to regulate the practice of dentistry; their word is final and their judgment is absolute. How is it, then, that so many dental advertising men enjoy such a lucrative practice and succeed in many cases in an open violation of the law? I ask, too, how does the public feel towards these advertisers? Do they know their real standing as dentists? Have they ever been told of their methods, or is it only by experience that they find out when it is too late? Has the public ever read in the newspaper of this or that concern being convicted, put out of business on some charge as against the state law? Some may say that the quacks are a necessary evil and we should put up with them; that every large city has its quota; that we who practice dentistry in an ethical, legitimate manner have nothing to fear from them. But, gentlemen, this is only true in a measure. I can well remember in this city when we had *no* quacks, when we had only a small number of dentists and the community was given better dental service and also held the dental profession in higher esteem than they do today. Why? Because they, the public, had no underlying principle, such as these imposters adhere to, to misguide them; they looked upon dentistry as an art,

a profession, not as a commercial commodity to be sold, how cheap or how poorly done. The Barnum methods of the advertising dentist are not like Richelieu and his little wanton boy who swam on a sea of glory, never to rise again; no, gentlemen, their sun never sets, their lights never wane, the long night passes, but their day begins again to catch the unsophisticated mortal to rob and cheat him of his all.

Now, I maintain that the State Board of Dental Examiners can do more in educating the public against these scavengers of society than even we ourselves, and my argument is this: If, in the first place, the Board of Dental Examiners was not a political one, appointed by the governor of the state, but was elected by ballot from the members of the State Dental Society, there *never* could be a member selected on that board who would add a stigma of disgrace to the dental profession, and whose ethics and past professional life is questionable. Nor could a rank advertiser grace this high office with his presence. It would not be a matter of politics, but men of unimpeachable character and high intellectual attainments would compose its personnel. Then could these men give their best efforts to the uplifting of dentistry, in driving out the quacks, and in showing the public what these men, these practitioners, really are, and thus educate the community.

If they can convict any illegal practitioner, they should publish the fact so that the public and we dentists will know they are doing their duty. As a matter of fact, with regard to the conditions in this state, I have never heard of a single conviction, nor seen any report whatsoever of the work done by our Board of State Dental Examiners in the fifteen years that I have practiced dentistry. The state does not meet the expense connected with this board of examiners. Why, then, should the state designate entirely who should compose it? I think every reputable dentist in the State of Michigan would willingly help, financially, a board that would try and overcome the evils of advertising. If only finance is needed to do this, certainly it should be easy of accomplishment, and we would get better results than at present. May I be permitted to ask you then, gentlemen, if I have proven my point: can the board of state examiners educate the public? Can they uplift our profession to the extent we desire? I know your answer. If, however, the State Board of Dental Examiners does not *realize* the importance of this education, then the profession itself must awake to its crying needs and see to the enlightenment of the masses in this respect, and I think we can be worthy aides in this education of the public and thereby overcome the evils which we see prevail to such an extent in this city and elsewhere.

The action of our late governor in pardoning six murderers, and the unbridled power in placing men on different commissions for political greed alone, stamps and shows what harm a law can do; how any one man vested with executive power may militate to his own interests and to the detriment and the welfare of the community. And just as this refers to



his power in behalf of the pardoning board, so also may it be directed for or against the duties of a board such as the State Dental Examiners.

Happily for us, the late governor's term of office has expired and a new regime been ushered in. This successor, gifted, as we are led to believe, with intellect to discern and power of will and courage of heart to execute, cannot, we trust and pray, make the mistakes his predecessor was prone to; but in our particular case will inquire into the need of the dental profession and, better still, determine the needs and rights of the public, and then, deciding both these living issues, appoint men to this board of dental examiners who from a universal standpoint are eminently qualified to grace their position. The past shows the need, and the future may confirm the necessity, of taking from a governor the power of appointment on certain boards, and then, or now, legislation must step in to vest that power where it rightfully belongs. Gentlemen, has that time arrived?

It is not my aim nor purpose to question the right of any member of the present Board of State Dental Examiners, who retains his seat on that honored body by virtue of all the ennobling qualifications of the dental profession, viz: ethical attributes, intellectual worth and the zeal to elevate the profession which he honors, but it is my aim, my purpose and my ambition to *condemn* those who may be appointed to this honorary position by virtue of a political deal alone.

In order to show the feelings entertained for our profession and ourselves by the public, I have asked men in different pursuits or callings of life to state their views concerning dentistry, and the mental, moral and physical make-up of the men who should practice it. The first is from a well-known clergyman of this city. He says:

"One of the most important, perhaps *the* most important, requisite necessary for the discharge of the duties of my calling is clear and perfect enunciation. The Maker told us to go and preach His word. He said that faith comes from hearing. How shall we make known the truths of salvation to our people unless they can understand us when we break to them the bread of life? If his congregation fails to understand him, the most saintly and zealous preacher will fall far short of the mark: his influence for good will be minimized; and souls will not be saved to Christ. Therefore, I thank God that dental art has made so much progress during the last decade or so, permitting the skillful dentist to work miracles of cure, or preservation far superior to those Christian Science claims for devotees. Your reward in this world is not commensurate with your deserts. Ingratitude is too often your only need. But you do not work for paltry lucre alone. It is enough for you to know that you are doing God's work in alleviating the sufferings of poor humanity. And your reward is the consciousness of duty accomplished with courage and perseverance. It is distressing to see, in this age of refinement, the woeful negligence with which people who ought to know better treat what they consider such a small detail as the teeth which adorn their mouth. It is only when indigestion or dyspepsia renders life intolerable for them that they condescend to go and visit a dentist. It is indeed time that people should awake to the fact that there are some miracles which even a dentist cannot perform; that the evil must be nipped in its bud; that a dentist's

office is not necessarily a chamber of torture, and that a doctor who, like you, is impressed with the responsibility and dignity of his calling, will leave no stone unturned and no new invention untried until he has restored to the patient the complete use of what, in God's mercy, was meant to be, not a source of discomfort and pain but a *sine-qua-non* to the proper enjoyment of life."

The views of the lawyer follow:

"As you are well aware, gentlemen, the evolution of the dental art has been most wonderful and in keeping with this progressive age of ours. When formerly one was content to have his teeth extracted, today he fights for their retention, even makes a sacrifice, and in connection with this statement I am inclined to the belief that the education of the people has helped greatly to the accomplishment of this idea. Especially is this so among the better classes. You all remember the old saying, 'Clothes do not make the man,' and now there has been added to this adage the further line, 'they help, though.' Just so may we say, 'that while teeth don't make the face, you certainly believe that they are a most important and prominent factor in the human countenance.' Is the laity cognizant of this today? I think so. People today naturally are particular as to their body, and I might add a great deal more so than of their soul, and in comparison of the two, as the eye is to the soul, so are the teeth to the body. Business and professional men of today are aware of this; they deem it an asset in their business, and on the contrary think it a great liability and detriment when possessed of poor and aching teeth, and especially is this so among those of whom enunciation of words forms part of their daily curriculum. There is no doubt as to the clergy in this respect, and I take it that the lawyer will subscribe likewise. With reference to this latter profession, I would propound this question: 'Would our legal brethren be better satisfied to have poor teeth in his client's anatomy than not?' As a premise for this argument, may it not be stated that poor teeth are productive of some fighting spirit and most frequently a cause of great trouble, and is not this what the lawyer wants? I do not know of any instance wherein an aching tooth was the direct cause of, say a murder, or an assault, or a divorce, or such like, but I can see where it might be, especially when in connection with the home. You take a serene and happy body, one possessed of little bodily ills, and while he may not be altogether free from this fighting spirit, yet I apprehend that he will be less given to it. So I say, is it not a question as to whether good or bad teeth may influence; and if unsound teeth are a detriment to one and an aid to the other, will not this education of the masses to the fact that dentistry, as applied today, can and does work wonders to the mouth and the body, in the end be a safeguard against many of the ills that flesh is heir to, a saver of money, and most beneficial to mankind in general?"

I now have the pleasure in presenting the views of a layman. You will observe that his diction is perfect, his argumentation true and logical, and his thoughts concerning our profession most interesting and timely:

"We patients of the dentist," he says, "knowing so little about the care of our teeth, can but confess to know less about the needs of the dental profession, still one may be interested in a subject knowing but little about it and may even escape censure for attempting to write about a matter of which he may have neither interest in nor knowledge of.

"Let us, then, examine ourselves to determine what we laymen know about dentistry, and about teeth; and later determine if we are interested

in the manner of men whom we would prefer to have make up this profession and operate upon us.

"The effects produced by the dentist upon our own molars, or the results we observe he has produced upon the masticating tools of others, constitute the layman's limited knowledge of dentistry.

"What we know about teeth is likewise limited. To begin with, few of our members could guess what number of teeth is the allotted portion to mankind; so one is never quite sure whether he has had his full quota or if Nature has cheated him of a molar or two. From observation and sad experience, we do know that as infants we begin to raise teeth; the first crop is a failure. Beginning all over again, the second growth is evidently made of some sterner stuff, for, if lucky, we can manage to have the majority of our ivories left by the time we reach the early thirties. We do not recall the birthday of our first tooth (though history records that we were much alive when it was born), but can fancy with what joy our fond parents discovered it; and likewise can well imagine our own sorrow when finding our *last tooth gone*.

"The tooth is the last portion of our anatomy to be moulded and the first to decay; intellect, heart, eyes, ears, lungs and limbs, the grand majority of mortals have with us always; but our teeth fall by the wayside, milestones on our journey from the cradle to the grave.

"Possessing teeth, we eat anything that our stomachs and purse can stand; without them we are limited to soups and sops. Having teeth, our speech is intelligible; lacking them, we mouth our words. Adorned with teeth, some may think us handsome; wanting them, no flatterer would call us good looking. Poets have written sonnets about the beauty of teeth and Holy Writ has quoted their value on a par with the eye when saying, "an eye for an eye, and a tooth for a tooth." One might argue from this Biblical passage that the tooth is the more valued of the two, for we have but a pair of eyes and could ill afford to lose one, but of teeth we have a variety, and one less would not matter much. One false tooth (now-a-days) is an item of necessity, if not of pride; but a glass lamp is neither a thing of beauty nor a joy at any time.

"When taking inventory of our anatomy, we find the teeth among our chief assets. To good looks they are essential, in speech they are important and in eating they are the promoters of our physical charms, the assistants of our oratorical accomplishments and the guardians of our bodily welfare.

"If the eyes are the windows of the soul, more truly are the teeth the lookouts of the stomach. Some few of us live only to eat, but all must eat if only to live. And the teeth are the watchful sentinels by which each morsel must pass and bear investigation before entering our vitals to rightly recuperate our wasted energy.

"Examining the subject from our point of view, we laymen conclude, then, *that in our business we need teeth*. Since we know so much of their value and so little of their care and treatment, give to us then men in the dental profession who are amply qualified to nurse, to protect and preserve our molars, honestly and intelligently.

"In all trades, in all arts, in all professions, we have the good, the bad and the indifferent representatives, but in specialized branches of knowledge the survival of the fittest stands alone.

"In the legal profession we have specialists of criminal, of commercial, of corporate law, etc. In medicine we have specialists to care for the eye, the nose; others to cure the ailments of the throat and lungs;



doctors to string our unstrung nerves, and surgeons to cut up the balance of our anatomy.

"In dentistry (so far as we know) we have dentists, and dentists only; specialists in the medicinal and scientific treatment of the teeth. In law and in medicine the chosen few, by virtue of their training and knowledge, educational knowledge and a specific training which years of study have acquired, make up the specialists of their professions. In dentistry all who enter it are specialists by *might of a diploma alone*.

"Thus do men specialize for the care of our teeth — our teeth, the watchdogs of our stomach, and our stomach is the furnace of our bodily life, the ashes of which, unlike those of a dead love, can never be rekindled.

"Truly, then, dentistry must be a study of vast import, at least it is to us, and the practice of it must entail an abundance of learning that cannot be acquired in a hurry. Truly, then, this specialized knowledge can be grasped only by a mind cultivated for its receptance; a mind so broadened by former studies that the reason is enobled, the will armored in honesty, and the intellect expanded to a comprehension of the bigness of a specialized knowledge so allied to the welfare of mankind. Give to us, then, dentists of intellect as well as skill and hereafter let the faculty of the dental colleges, examining the student about to enter, inquire not as to the girth of his biceps but as to the caliber of his brain."

#### ABSTRACT OF DISCUSSION

DR. L. P. HALL: Any man, in whatever profession or calling he may be, is better fitted to fill it and fill it easier if he be possessed of a good education. Discussing a paper on Education is rather difficult. The essayist this evening has stated that he would treat Education in an original way. If he be given that privilege, then those who discuss this paper must also discuss it in an original way.

The writer of the paper needs no eulogy from me. The fact that he has entertained you for the period of half an hour and has carried your attention with him all the time shows in itself that his paper has some merit. His paper is nicely written and very beautifully delivered. I am glad that we have a topic like this once in a while, and I am also proud of the fact that we have a man who can so ably present the question, as has been proven this evening. In discussing a paper it is usually customary to eulogize the writer or essayist and agree with almost everything he says. While I may say that had I written the paper I would not have written it just the same, I don't want you to get the idea I would have written it as well. I don't make that claim, but I make this claim, that I don't agree with all that he has written. The first objection I make to the paper is the very high classification that he gives the dental profession. Now we of the dental profession are proud to be members of it, and we believe that it is "some" profession, using a slang expression. I don't know what to say in regard to his assertion that our profession is head and shoulders above any other profession. I am willing to admit that there are some other professions. I don't agree with his assertion that when he commenced the practice of dentistry, 15 years ago, there were no quacks. I can call upon those who have been practicing dentistry longer than 20 or 30 years, and they will tell you that there were quacks then, and there always have been quacks, and I think there always will be, judging from the very slow way in which they are being exterminated. The reason that the essayist did not know they were quacks was possibly that he was so enthused with this new profession in which he had been recently graduated that it had so taken his time that he had failed to see anything else except the noble profession that he was practicing.

The next point I wish to bring up is the very harsh way in which he treated the advertisers. He sees no good in them at all. The advertisers, while I have no great love for them, yet I claim that they do some good by the beautiful advertisements

placed in the public papers—that is about the only dental literature that a great many people ever see, and they have it fixed so that it is conspicuous, and one can hardly look through a paper without noticing it. I dislike to notice it, but they force me to, and I see it every day. If I see it every day, who don't wish to see it, how about those who don't know as much about dentistry as I? They must see it, and the great uninitiated in regard to dental work oftentimes get the idea from that that there must be such a thing as dentistry, and possibly it is practical for them to find out, and they do. In that way the advertisers disseminate dental literature.

The next point I would not have put just as he did. He starts in with the state board of dental examiners. As the state law now is, it is largely the result of the men who are on the board, and as they are very closely associated, we can drop that. Now there is a point I wish to make. Every one who writes on education is always speaking about the standard that students should have. That is right. Don't you think, gentlemen, that it is about time for us to adopt some standard for the examiners? We have, roughly speaking, as I understand it, about 1500 dentists in Michigan. Is there a man here this evening—or a dentist—who will agree that you could take any one of your 1500 and put him on the board? You do not. Then if the whole 1500 are not qualified to serve on the board, is there any provision in the law whereby you won't get one of those who could not serve if they were appointed? You have not. I look at the state board and the state law this way: I don't wish my sentiments interpreted personally, I don't mean them in that way. If the state law and the state board of dental examiners are perfect, we have nothing to say. We are wasting effort. But if the state law be not perfect, if the state board of dental examiners are not perfect, then a discussion along these lines once in a while may bring out some point whereby good may come of it, and that is why I want to talk a little upon this. This is a question that I possibly ought to approach with some fear and trembling, because I have discussed it before, and upon every occasion that I have done so I have always known I was in somewhere before I got through. The only objection that I have is that I have had rather much ridicule heaped upon me and quite a little cheap sarcasm; I wish, therefore, to tell the members present that I know my name is Hall, that I come from Delray, and that Delray isn't all of Michigan, although it's on the map. Now, if the state board is to be criticised, as it has been this evening, because they won't prosecute the criminals, I look upon this more leniently. Did it ever occur to you that it is a pretty difficult thing to convict a man who is violating the dental law? For instance, if some violator were located near you, and you were perfectly satisfied that he was practicing illegally, you would fear to go out and prosecute him. Suppose you did take it in your own hands to prosecute him and he takes the matter into court, or you take it into court, and he comes in there with you. He will engage a lawyer and that lawyer can make you look very cheap before he gets through with you. He will no doubt elect to have a trial by jury. Now see what will happen when he comes up before the intelligent jury. His lawyer will state, no doubt, something along this line: The dentists have a combination which he would possibly say was a trust, and the fellows who don't belong are looked upon with a good deal of disdain. This man is trying to make an honest living and he is trying to work, possibly a little cheaper, and thinks he is a humanitarian and is helping the poor people, and these men fear that their high prices are going to be cut, and, fearing for their own safety, drag this fellow into court. When the lawyer gets through with his talk, and it goes up to that intelligent jury, where is your verdict? It is hard for the state board to prosecute. I do blame them a little bit on this line; when they were discussing the present law they said that they were desirous of having \$3 tax registration fee for the purpose of forming a fund, so that that fund might be used for the prosecution of these violators of the law, and they talked about it so eloquently that I feared at one time that we would have a scarcity of jails; but, gentlemen, we have jails enough. Dr. Meridian said he has never heard of a conviction. I think he is not exactly right. I think they have

tried to, but I don't think they have tried as hard as they could. I think each state law should be amended so that the dental profession might act in conjunction with the profession of medicine, which should have some sort of a man whose business it would be to look after the violators of both professions. If we had that, I think we could get along and convict some of them. I don't charge the state board we have, but I charge the state law with having some of the defects of which he spoke about. The state law does not, in my opinion, give the man who writes on it a square deal. For instance, there is no way under heaven that a candidate can see his papers after they are read. That is not fair. The most humble politician who runs for the most menial office, if he be defeated, may have a recount by putting up a small sum of money. Where is your recount here? You are down and out. Now, is it right that the governor of the state should have the selection of the members of the dental board when he is not a dentist? We have never had a dentist governor, and judging from the political ability of the dentists, I don't think we ever will; we have no hope in the future, or the near future, that we shall have a governor who will be a dentist. I would be glad if we did. The governor selects a man out of these 1500 men. Is he more apt to look to see that the man is properly qualified, or to look after his political pull, or how big a factor he has been in advancing the governor to his position? Supposing he picks out a man without ability to serve on that board. We have a great number of practitioners who have never been to college previous to this law, which has been passed, which provides that all candidates for the position must at least have a diploma. There are dentists in the state who have never studied histology, bacteriology, chemistry. How in the world is that man to examine the graduates of the University on the subjects which he has never studied? The only reason that I could give for having the law so that a man could not get a chance to re-read his paper, that possibly they expected at some time that there would be five men on the board who had never studied some of these subjects, and therefore could not examine them at all, but would simply say, well, he will be all right. The position of this board is peculiar; there is only one thing that I have ever heard like it, and that is the ancient laws of the Medes and Persians.

There is one phase I don't like about the board, and I think it is up to the dentists to see if they can't get the law amended whereby there will be some chance for the dentists having some say in the selection of the men. Now, if the governor would be willing to be advised by the societies of the state as to the best men, he would not go wrong. The state dental society could hand in 50 names, or 75 names, and the governor could appoint from these men who would be acceptable to the dentists. Of course, I can readily see that none of these government officials like to relinquish any power they already have; I would not like to select one man, but it seems that if the governor wanted to do the right thing and had the best interests of the state at heart, he would be guided, to a certain extent, by the suggestions that we would give. Now if we could in some way secure some improvement whereby the bad features of the present law could be removed, it would be better.

Another objection I have to the present state law is that we have raised a certain amount of money. I received a pamphlet not long since which showed that that money is nearly all spent, but it does not give me any idea how it was spent; it simply says, receipts so much, disbursements so much, balance so much. Very intelligent. Now, if my receipts for the year were \$2,000 and my disbursements \$2,100, I must know why. Now I see that they are making a sort of forecast of what the expenses will be this year, and I am glad to see that one item is \$75 for the reports to the dentists. That is good. I never received a report before; I received this one through the courtesy of Dr. Burke, for which I wish to thank him, to tell him that the financial statement showed me very little. If there be any strong financial man here who can read between the lines and see wherein there is a fund of information in that I shall be glad. In talks of this kind, let us not be personal, but look forward to the time when we can



have a better law. I think the member of the state board who is here this evening, if he wishes to go on record, will say that there are improvements that might be made in that law. Let us give up this petty jealousy. What is good for the dental profession individually must be good for us collectively. The truth is that we have some fellows a little slicker on some lines than others, and the first thing we know, instead of having it as we want it, we have not. Now, gentlemen, I thank you for your attention and I wish to inform you all that these are my sentiments, and I believe I am entitled to my belief. If you don't like them, you are privileged to discuss them if there be anything you object to.

DR. C. H. OAKMAN: I want to congratulate Dr. Merdian on his most excellent paper, as well as manner of delivery. I believe that the dentist of today should be better educated than the dentist of twenty years ago. The world is advancing rapidly in all walks of life, and it is necessary that the dentist keep up with the march of progress. There is no standing still; we must either progress or retrograde. The majority of our state dental boards are endeavoring to do all in their power to raise the standard of education. New dental laws have been enacted recently whereby it is possible for many of the states to obtain reciprocity. Michigan has reciprocal relations with twelve states, and I hope the time is not far distant when there will be uniformity of dental laws, but that cannot be until the states wishing reciprocity with Michigan have laws whose requirements are equal to ours. I think the remuneration of the dentist has never been sufficiently high for men to spend the time required for a literary or a medical education. This means several years of application and expense, which to the average dental student seems superfluous when the remuneration is not commensurate.

DR. N. S. HOFF: I am always interested in a question of this kind, because the dental profession means as much to me as it apparently does to the essayist of the evening. The impression made upon me by this paper, and the sentiments which seem to be in our minds, is that the dentist ought to be better educated. I heard this question discussed at a dental society meeting where there is any other thought expressed than that dental schools should require better dental educated men, meaning that the entrance requirements of the schools should be raised so that we should secure better students to begin work with. I believe this is the sentiment of every dentist who is in practice. And why is it? At first it would seem as though it may be a selfish motive that prompts the dentist to ask that in future all applicants for admission to dental schools shall be better educated men.

A young man called upon me recently who has been in some other work for considerable time; he left school when he had completed only two years in the high school. He has been engaged in business of various kinds, and now has come to a place where he thinks that he would like very much to enter the dental profession, and he wanted to know how he could prepare himself to enter our school. I told him that it would be necessary for him to be a graduate of a high school, or he would have to pass the entrance examination given by the examining committee in the literary department of the university before we could admit him, as this was now a requirement for admission. He inquired what that meant, and when I told him he said, "Why, that would be impossible for me; I could not do either of those things." And he said, "I have been saving my money and I have been thinking of this thing for years, and I am so far along in years now and I had determined that I would enter the dental profession and now your requirements exclude me. I don't see how it is possible for me to meet your requirements." I told him I was very sorry—as I always have to say to these men, and I really was sorry for the man, because he was so anxious. He is a man of mature years and mature decision. He is a traveling man and said he was earning \$200 a month, and he had been saving all the money he could. I said to him, "Why do you want to go into dentistry if you are earning \$200 a month?" He said,

"I am tired of this kind of work and want a business of my own. I have no trade and have no occupation I can follow, except as a traveling man, and I am tired of it. I have no home nor family relations and I want something to do that will give me these things that I felt I wanted most. I never have had the joys and pleasures of a home life such as I want to have; I have been dreaming of this thing for years and have been preparing myself." I said to the man, "I wish I could help you, because you seem to be in earnest." I am confident that man, if he ever entered a dental school, would succeed as a student and a dentist; he would qualify himself properly. He had the qualifications to do that, but he could not enter for lack of the educational qualifications.

These are the kind of cases that I am meeting and having to contend with all the while, and I have no option in the matter. I can't help these men, nor do anything for them. That man, I know, would make a good, honest and reputable practitioner, and he would do a lot of good in our profession if he ever got into it. I have these cases to deal with all the time, and when I hear a mature paper like this and hear you gentlemen say that a man should have certain qualifications to enter a school, and I know he should have these qualifications myself. I can't help thinking of the many earnest men who would but can't. I have to make decisions against them, and sometimes it is pretty hard to do it. You may think it is an easy matter to say "no" to such men, but it is not an easy matter; it requires a lot of determination to deal with that sort of thing.

I am not saying this at all to controvert the sentiment that seems to prevail that we need higher entrance requirements; as a general thing we do, but I have often wished that there was some more liberal way in which we could deal with a certain class of men. We cannot make a law or rule that will reach them. The point I want to make in connection with all this is that I am glad that there is a sentiment that will sustain and support laws which establish the standards of education. I am glad that that sentiment is growing and developing and becoming stronger, and that the profession generally is willing to sustain and support institutions which will maintain the high standard and that will demand state laws requiring institutions to live up to and maintain these standards, because I know that men who have educational advantages and mental training make better students and accomplish more in the profession than the men who never have had these advantages.

The idea that the man of broader culture who comes into our profession, which so largely is mechanical, has the advantage over the man who has only the mechanical training, is not a new one to me, but I was glad indeed to hear the essayist express it in his paper, as it is a new thing to get into a paper. I don't encounter it very often, and the charm of this paper tonight, to me, was that as a profession we have a duty that is broader and greater than that of mere technical ability and skill. It seems to me that there is no profession where general culture would count for more than it will in the dental profession. There is no profession where one comes in contact with people for a longer time, and in more intimate relations than they do in dentistry. We have our patients under our close supervision for hours at a time. We get intimately acquainted with them, and we have opportunities, not only for exercising our mechanical skill and ingenuity, but for holding social intercourse and friendly relations with our patients that may be of the greatest value. This being the case, would it not be possible for us to exert a greater influence than we do in educating the public, through our patients, to higher ideals of preventive dentistry? Very many of the ills of the body would be taken care of if every dentist would do his whole duty in educating his patients and putting the value of his services before these patients in such a way that they would not only take care of their own teeth, but they would get a proper appreciation of their importance that they would go out and be the means of disseminating professional knowledge to humanity in general. It seems to me that this would do a great deal more to solve this great problem which is now being so eagerly considered in vari-

ous ways than all the conventions or oral hygiene congresses that can be gotten together. I value these things, of course, but if all dentists in their own office were doing their full duty and would inspire their patients with the idea that they have a duty also, of carrying our message, we should do a broader and greater charitable work than we are now doing, and we would be then entitled to that high position which the essayist has tried to show us was ours. I don't think the essayist has overrated us. I feel as though our profession was one of the grandest of the great professions, and I am glad I am in it. Dentistry is doing more for the world today than ever before, and it looks to me as if in the near future we are going to do a great deal more, so I am particularly pleased with this essay because it has so much in it that it stimulates me. I believe we have a place in the world's work that is worth while and is worth doing in the very best way. Whether we raise the standards of our dental colleges or dental laws and examining boards or not, this great duty rests peculiarly with the profession. We cannot legislate such matters at all; it primarily rests with the dentist as he stands at his chair and talks and works with his patient. I think the college has a duty, and it has an opportunity to train its students to do a better grade of work, and of course to inculcate higher principles and professional ideals. If our schools, legal boards and the profession generally will pull together along this line, it seems to me that our profession is bound to grow and become one of the greatest forces in the world's useful work.

DR. MERDIAN: I only wish to thank the members who have taken my paper so kindly. I was somewhat afraid to read a paper bearing on this subject, because I expected as many rents and stabs in it as the toga that Caesar wore, but happily most of the gentlemen—I think nearly all of you—have shown me that your thoughts correspond with mine.

In conclusion, I would ask, is there not some way by which we could deny proprietors of certain dental parlors, who are not registered and qualified dentists, from owning or operating these offices for greed and commercial purposes alone? I think something should be done in this respect. About a week ago I met an acquaintance whom I had not seen for seven or eight years, but who at that time was the proprietor of a laundry. He greeted me and remarked that he was now a competitor of mine. Rather surprised, I asked if he had taken up the profession of dentistry and had qualified through a reputable college? "Why, no," he said, "I don't have to; I was a bartender for the last five years, after giving up the laundry business, and have now bought out the dental business of . . .," naming a certain establishment in this city. Truly, gentlemen, a *grand* metamorphosis; one week dispensing liquid refreshments, the next conducting a dental office—without skill, past experience or knowledge—and ministering to the wants of suffering humanity. Gentlemen, should we *not be proud* of such an acquisition to our ranks, should we not likewise feel elated that our state law permits such a man to grace our profession? I believe, and I know, you, my colleagues, will uphold me in this belief, that there is much need of reform in this matter, and the *present* is assuredly the time to bring it about.

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#### BEST PUMICE "CARRIER" FOR POLISHING

The choice of a "carrier" for applying pumice powder to the lathe brush is not without some importance in regard both to the speed and efficiency of the work, and the health and comfort of the worker. Many substances have been tried and are in use for this purpose, but probably the one that will be found to possess fewest disadvantages is *glycerine*. The advantages of glycerine are,—the pumice is kept well on the brush to the work, and does *not* fly about; there is good lubrication and quick cutting; it is always ready to use; there is a distinct economy of pumice, and it is cleanly in use by being easy to wash off from hands or work.—R. Glendining, L.D.S., London.



## THE MODERN DENTAL COLLEGE.\*

By H. M. Semans, A. M., D. D. S., Columbus, Ohio.

IN MY SUBJECT, "The Modern Dental College," I am not limited in dealing with it, owing to the fact that the founding of the first dental college dates back within the memory of living man; therefore I shall touch upon the dental college phase in its entirety, aiming, however, to present to you what the present day aspects are, after a short historical sketch.

The creating of the first dental college was an epoch in the history of dentistry, probably the most momentous one. The cause of this act we recognize to have been the need for concerted action in training young people in all the arts of dentistry by competent teachers, each teacher being more or less of a specialist in his line of work. Prior to the founding of the first dental college it was the custom (a custom which lasted for a long time) for some dentist more or less gifted in the art of teaching, to take on an apprentice and train him in the knowledge of dentistry. Sometimes the young man worked out his tuition in various ways, washing windows, sweeping, cleaning cuspidors, collecting bills, doing rough work of the laboratory, etc., more often a monetary stipulation was entered into with the above-mentioned work thrown in. In all cases the beginners were supposed to become possessed with secret methods, methods perhaps only known to their instructors, and they were often required to bind themselves to never reveal these methods. A very few of the brighter lights in the then small world of dentistry went a little farther and conducted small classes in their offices, generally at night, for which they received compensation. One of the most noted of these instructors during the early years of the last century was Horace H. Hayden. This work, both in public and private instruction, he took up shortly after he went to Baltimore. In his historical sketch of the Baltimore College, Dr. Simon tells us that during the session of 1837-38 Dr. Hayden was invited and gave a course of lectures before the medical class of the University of Maryland: thus probably the seed was sown from which sprang the college, of which he was one of the two founders and the creation of which greatly aided in giving him everlasting fame.

As we all know, he had associated with him in this momentous work Chapin A. Harris, and the act passed by the General Assembly of Maryland, February 1st, 1840, incorporating the Baltimore College of Dental Surgery, created an era of vast import to our profession. On the same day that this act was passed the charter was issued, and in the evening of February 3rd, two days later, at half-past seven o'clock, at Dr. Hayden's house, a faculty composed of Drs. Hayden, Harris, Bond and Baxley, all bearing the M. D. degree, met with a view to organization. Dr. Simon

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\*Read before the Columbus Dental Society.

further states that Dr. Horace H. Hayden was elected president and given the chair of Dental Pathology and Physiology, Dr. Chapin A. Harris was elected dean and given the chair of Practical Dentistry, Dr. Thomas E. Bond, Jr., to be Professor of Special Dental Pathology and Therapeutics, and Dr. H. Willis Baxley to be Professor of Special Dental Anatomy and Physiology. There is no doubt but that the uniting of the powers of these two capable, vigorous and intelligent men, Hayden and Harris, accomplished the successful issue. Hayden was the accomplished, keen-minded educator, clear in presenting facts; Harris, although a man of scientific attainments, was likewise a man well acquainted with practical affairs.

As is well known, the institution from the day of its birth was a complete success. "The founders of the school," according to Dr. Eugene F. Cordell, "first endeavored to engraft it upon the University of Maryland as a separate department of the same. Being unsuccessful in this, doubtless owing to the unsettled condition of the latter, they boldly launched out upon the untried seas with an independent school. Their immediate and marked success showed that the movement was opportune and that they supplied a real want." The faculty of the university, in a letter rejecting the proposition, said that "The subject of dentistry was of little consequence and this justified their unfavorable action." In the fall of 1840 five young men enrolled as students, and the introductory lecture was given by Dr. Harris on November 3rd. March 9th, 1841, Robert Arthur and R. Covington Mackell received from the hands of Dr. Hayden the first degree issued in such surroundings, that of Doctor of Dental Surgery.

From this small beginning there grew the constantly increasing number of dental colleges until today they number over sixty in America and probably more than that abroad. From a small room in Baltimore, seventy-one years ago, dental education in dental colleges has grown from four teachers to over fourteen hundred in America alone. In 1841 two were graduated; today we probably average two thousand yearly. The value of grounds and building then was nothing, a few dollars only in chairs and tables, today in grounds and buildings and equipment close to three millions; the income then was a meagre few hundreds, today it is over four hundred thousand yearly. Do you realize that the yearly income of today and the vast bulk of valuation came and still comes from tuition paid by students? In the United States we have yet to see a single case where a financial gift from some wealthy person or persons has been put to use in the cause of dental education as presented in the dental college, and probably but a dozen universities present dental departments built and equipped by state or university funds. We are told that the late Dr. W. D. Miller at one time referred to the dental profession as "self made."

Since the University of Maryland compelled an independent condition to take place, time has brought about a great change, so that today we find about eighteen universities having genuine dental departments. The majority of these departments participate in medical and general laboratory

facilities, several of these dental departments, because of situation, etc., exist practically by themselves. About sixteen medical colleges present dental departments, with most of these departments participating in class rooms and laboratories. There are about sixteen dental colleges affiliated with universities or colleges in which a participation in the latter's (universities or colleges) equipment is practically nil; two or three exceptions are found, however, where some participation takes place. About eighteen dental colleges maintain an independent existence, in which existence a few are found availing themselves of facilities in neighboring colleges, such as the dissecting department of a medical college.

Dental educators are constantly aware of the fact that the dental laity, through utterances in meetings, magazines, etc., are urging the betterment of the dental schools, and they, the dental educators, accept the same in good faith, realizing that most of the criticism is actuated by the one imparting the same because of a desire for a general professional advancement. Criticism, even though at times rather vigorous, stimulates a good cause. Here and there in our short seventy-one years of dental college existence some school passes into the realms of silence and dimming memories; some of the schools closed their doors, still retaining honor and glory for what they had done; others are well forgotten, and about them the less said the better. A large majority of the existing ones have made and are now making advancements; dry rot and stagnancy inevitably bring obliteration.

What today is the purpose and intent of the dental college? First, the stock-existing, interest-bearing type of institution, created because of possible financial gain, is either changing its type or slowly giving way. Professional status, if of a high grade, must have an uncommercialized educational foundation. Some excuse may be given for the existence of such conditions in the past. The profession was young and growing through its own limited means; it took much money and many sacrifices to establish dental colleges. States, municipalities and university boards of control took little or no interest financially in their establishment; and right here a little history is interesting. Over forty years ago the Connecticut State Dental Society asked the Yale incorporation to establish a dental department; the latter institution professed an interest in the proposition, asking for a ten thousand dollar donation from the society; that is as far as it went. There being then little or no aid and resources from without, the issuing of stock was necessary to equip and maintain, the venture was uncertain and the business and monetary side of the situation took first interest in the minds of stockholders; the needs of the profession for educational institutions interested all prospective stockholders or those financially interested in any way far less than did the question as to whether the venture would be a sure go and a paying one.

But time changes everything, and dental colleges existing and being maintained for dental educational purposes only is simply one of time's



manifestations of the inevitable. It is not so much the survival of the fittest as it is the survival of the needed that will place our profession, through its colleges, upon the proper basis. Then again, independent existence is slowly but surely decreasing; the constant demand for improvement from the colleges themselves and from you, the laity, compels not an affiliation but an actual existence with medical schools or universities, or perhaps both, to take advantage of the various scientifically equipped and conducted laboratories.

The day has passed when professional schools such as medicine, dentistry, law, etc., can well exist without the properly established university to take care of the fundamentals. In educational circles it is now accepted as a fact that teachers of these fundamentals, such as in our dental courses, anatomy, physiology, chemistry, histology, bacteriology, etc., must be exceptionally well-trained men, who give their individual attention to such work. In what possible way, then, can dental colleges obtain such service except by availing themselves of such men, and availing themselves of the best service of such men only in the laboratories where they labor? We can find dental colleges that maintain a high standard of efficiency which can not or do not avail themselves of these opportunities, but their efficiency would be greater could they do so.

A very interesting society of the dental world today is the Institute of Dental Pedagogies, a society of dental teachers from most of the colleges in the United States and Canada; and what is their purpose? Meet once a year to have a week's vacation and a social jollification? Far from it. Every possible way that can be thought of to advance methods of technique, training, class room teaching, laboratory and infirmary instruction is brought out, thrashed over, built up and wrought over, not once but again and again in order that the teachers may satisfy you and themselves that they are performing the duty placed upon them.

The governmental aspects, executive methods, etc., have been looked after by the National Association of Dental Faculties, or individual executive boards of control to take care of and work out to meet the collective and individual needs; arduous and conscientious thought and labor has been given in the past to bring about general uniformity consistent with the demand of the times and the welfare of dental education, and there is much to be done in the future. But how can dental education progress unless the real progression is in the teaching? So, then, you will find the unselfish earnest work done by the laborers in the Institute of Dental Pedagogies to be elevating and advancing dental education.

When the Harvard College incorporation, in 1867, decided that dental education was of great import, then commenced another momentous period in the dental world with which the dental colleges have a bearing; Pennsylvania, Michigan, Iowa, Minnesota and others have fallen into line, it requires no imagination to see what the future will bring. Another organization, a new one, which I believe may do much in advancing the dental

educational situation, is the Dental Educational Council of America. This council is composed of fifteen members; five are college men, five are state examiners and five are selected from the membership of the National Dental Association. The purposes are three, looked after by a sub-committee as follows: The Committee on Colleges, the Committee on Curriculum, and the Committee on Uniform Dental Legislation. Their duties are as follows: "The Committee on Colleges shall visit the various institutions under the jurisdiction of this body with a view of ascertaining the character of the work done, including preliminary education and whether the needs of the community in which said college or colleges exist are fully satisfied. The Committee on Curriculum shall present in its annual report to the General Council a model curriculum, with such changes as it may from year to year deem expedient. The Committee on Dental Legislation shall make a study of the existing laws of the various states and present an annual report on the possibilities of more uniform laws, especially in respect to dental education." Thus you see the profession at large, the examining boards and the colleges are found at last starting a work in unison for but one purpose, the increasing of the efficiency of the colleges. Is the purpose Utopian? Surely no harm can come from such a purpose, if selfish ends do not enter into the work; the pessimist may ridicule its evident lack of power to enforce, its members may weary in unremunerative labors, but the purpose is grand.

The day has passed when the renown of one man will alone make a successful dental college; busy dental infirmaries or clinics no longer mean a successful college if the other departments are slipshod; nor can first-class didactic teaching keep up the high standard alone; the laboratories, the technic rooms, the infirmaries and the recitation rooms must all be taken care of by unselfish, conscientious instructors who love their work. Hayden, Harris, Bond and Baxley seventy-one years ago had a complete dental educational institution with five or six chairs and one lecture table: are you familiar with what the best dental colleges present today in facilities of equipment and method? Contrast, then, 1912 and 1840. There was a time when a Mark Hopkins could have sat on one end of a log and one student at the other end, presenting a complete college in such a dual association. In all probability Dr. Hayden, prior to 1840, could have instructed and sent out from his individual teaching a well-equipped dentist. Today the demand is for a thoroughly educated dentist on a scientific as well as a practical basis. Logic, higher criticism, differential calculus, etc., will have no bearing in his education should he avail himself of it, other than tone, but an excellent laboratory acquaintance with anatomy, physiology, histology, pathology, chemistry, bacteriology, etc., gives more than tone — it gives a sure foundation, his capacity for thinking is increased in ratio to the thoroughness of this laboratory training. In the class room and by means of the recitative text-book the working of the laboratory are verified. A quiz book cannot make a clear, concise thinker. How about the

practical side, the direct work in hand, the primary object sought for — “Dentistry?” What a farce the college would be, could we conceive of such an one, which taught prosthesis, operative procedures and their allied subjects from a quiz book.

We accept the fact that the laboratory, technic room and clinic must train both mind and hand, that the text-book helps both teacher and students to hold fast to the subject. The practical training, then, must be carefully attended to. Those fundamentals that give the student the scientific foundation must present, with the direct dental training, a well-balanced institution. If in time it is found that three years is too short, then go to four years, the need of four years will bring four years rather than eliminate some one or more subjects that are already in a high class curriculum. Gradually, but voluntarily in most cases, the colleges have come to a four years' high school preliminary educational requirement. It is well that they should; voluntarily, but gradually in some cases, the colleges are revolutionizing the three years of the dental curriculum. Criticism cannot hurt a good cause, it will spur the good schools to better things should there be a reason for the criticism, and as to the poor ones or ones not needed, are there any?

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### A BIT OF DENTAL HISTORY.\*

By Dr. R. H. Leete, Prestonburg, Ky.

**I**N THESE days of modern progression we are apt to forget the past. A little retrospection will do no harm and may be of some interest to many of us who are too busy looking ahead to even think of what has gone before. A claim to originality in a paper of this type would be absurd, but I will try to arrange some historical facts as best I can.

When Herodotus, the Greek historian, went to Egypt from his Grecian home, he found on the banks of the Nile at that time the most highly civilized people in the world, and at that early date medicine and surgery divided into distinct professions. There were specialists for the eye, ear, teeth, etc., and professors for the instruction of pupils in the various branches.

Had it not been for the destruction of the Alexandrian library, records would now be complete. However, Galen, writing in the second century after Christ, mentions dentistry as one of the most honorable professions. Greece and Rome, in their palmy days, cultivated the art of dentistry, but to just what extent we cannot know, for during the general destruction that attended the “Dark Ages” every vestige of record was lost. Recent excavations and discoveries have served to fully prove their truth, however, and we also know that during these same “Dark Ages” the science of medicine in all its branches, reverted to a condition of superstition — when

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\*Read before the Kentucky State Dental Society, 1911.



all aches and pains were supposed to be cured by charms and mummerly of some sort.

Ambroise Paré, in 1579, about the time of the revival of letters, wrote a work on surgery, devoting some space to the teeth, which is probably the first authentic date we have. Then, in 1771, John Hunter wrote the first part of his celebrated treatise on the teeth -- in 1778 the second part was completed. This work laid the foundation for the English school of dentistry. It was afterwards added to, from year to year, by the great early English dentists — Fox, Bell, Blake, Waite, and others.

In France Dr. Bichat occupies the same relation to dentistry as Hunter in England. Although he was, strictly speaking, not a dentist, still his work on science devoted much space to the teeth and oral cavity, and his philosophy — “that no theory should be received, however plausible, which could not be worked out by demonstration and experiment,” made a true basis to build upon.

About the year 1700 dental art first assumed its distinctive character. Prior to that date it had been treated as a part of medicine and surgery. But it was not until 1800, when Professor Baume published, in France, his treatise on first dentition and diseases that accompany it — followed with a work on theory and practice of dentistry by LaForgue in 1802 — that any work devoted to dentistry alone appeared. A great many publications, of much the same character, came out in Europe in the next twenty years — first France, then England, then Germany and Sweden contributed to our knowledge. Prof. Ritzius of Sweden conducted a series of microscopic observations of the teeth, and was the first to differ from the earlier writers as to the true structures of these organs.

In America the first knowledge of dentistry was introduced during the Revolutionary war, and the first dentist of whom there is any record was named LeMair, who came from France with Gen. Lafayette's army. Soon after his arrival a dentist by name of Whitlock came from England; but the record of these men is very scant, and it is presumed their practice was limited mostly to carving teeth from blocks of ivory.

Dr. John Greenwood was the first native-born American dentist. He commenced the practice about 1778, in New York City, and is said to have been the only dentist in that city in 1790 — in which year he made a full set of teeth for Gen. George Washington. In 1795 he made him another set, which are said to have been the equal of any plates made up to that time by any European. They were carved from ivory and held to place by spiral springs.

Up to the year 1800 dentistry in America consisted solely in cleaning, filing and extracting teeth and carving plates from ivory. From this date, however, dental surgery began to be cultivated as a science, and the preservation of the natural teeth began to be regarded as of more importance than the insertion of artificial ones. Still the profession grew slowly, and up to the year 1820 the whole number of dentists in the United States

did not exceed one hundred; in 1830 there were more than three hundred, but not more than forty or fifty of these had attained to much knowledge of the art. There were no restrictions regarding the practice, and anyone could commence it at will. In 1839 the beginning of the end of this state of affairs took place, in the establishing of the "American Journal and Library of Dental Science." This first publication brought the scattered members of the profession together, and through their united efforts the legislature of Maryland chartered a college, with four professorships, for the purpose of affording more ample facilities for instruction in dental science than could be obtained by private teaching. In a few months the founding of this dental school was followed by the first American dental society, called "The American Society of Dental Surgeons." Two years later, in Richmond, Va., a convention of dentists was held, and at this meeting the Virginia Dental Society was formed. In August, 1844, at Cincinnati, the "Mississippi Valley Association of Dental Surgeons" came into being, and since that date we are all familiar with the steady growth of society work all over our country.

The increase in the number of dentists was very great from 1830 to '42. At this time there were about fourteen hundred practitioners. The various states now began passing their restrictive laws, and we all know with what success.

Gentlemen, isn't it a far cry from the days of filing a tooth for caries to the modern porcelain inlay, or carving a block of ivory to the continuous gum plate? Still, when we think of it, it hasn't been so very long. I sometimes think we are too apt to forget the past. Would it not be wise for us to look up the grave of Dr. John Greenwood and try to show our appreciation of his early struggle in a befitting manner? — or in some way to show that we have not forgotten the men who made our profession possible?

#### DISCUSSION.

The discussion was opened by Dr. Max M. Eble, who expressed himself as having enjoyed the paper very much and stated that he did not believe that dentists as a rule kept in touch with the history of the profession in the past as much as they should; that in his opinion, in many instances, much could be learned by the original ideas and suggestions of our forefathers in the profession. He related some little dental history not presented by the essayist, and particularly called attention to the fact that much of the dental history of the past was included in that of medicine, both being combined in a single profession.

Dr. Prothero stated that he had enjoyed the paper very much, but desired to state that in his research and reading of the history of crown and bridgework generally practiced today, that among the early efforts, the first effort was made by Dr. W. M. Morrison in 1869, when he constructed a crown on the order of the shell or telescope crown which we are acquainted with today, and from this single crown all crown and bridgework, as we have it today, has developed step by step; the foundation of all of which lay fundamentally upon the principles introduced in the construction of this crown by Dr. Morrison, namely, hard soldering, swaging cusps, contour form by the use of the gold plates, etc. He said that it had been his privilege in the few months past to refer to a great many of the old issues of the *Dental Cosmos* back as early

as 1835; all of which had proved conclusively, by comparison of the old issues of this journal with the up-to-date ones, that no profession has made the progress that dentistry has made from 1839 to the present time.

Dr. Eble further stated that, as a matter of dental history, dentists did not accumulate wealth, and that the dentist's work generally was naturally inclined to prevent his mind from broadening out into large and broad business ideas of the world; hence he did not have the opportunity to become trained in business methods generally that other men had; as a profession it did not offer opportunities for investments within itself; that he believed that the dentists, as a profession, were the greatest "gold brick" buyers among all classes of citizens in the country, and that he thinks the dentists should read and think on matters outside of their profession more and cultivate themselves along more general business methods and principles.

In closing the discussion, Dr. Leete stated that he did not desire to add anything further to the subject, but simply wanted to thank the discussors for the full and free discussion they had given his paper and the cordial reception it had received from the society.

## A PLAN FOR RAISING A FUND FOR AGED AND UNFORTUNATE DENTISTS.\*

By Dr. L. G. Noel, Nashville, Tenn.

WE HEAR of so many cases of distress coming to dentists, and so many appeals for financial aid are made by the friends of these unfortunates, that I suppose we have all at times felt the need of some kind of organization provided with means to take care of such cases.

At the meeting of the National Dental Association at Asheville in 1903, I endeavored to start a movement for the accumulation of a fund for this purpose. I quote the following from my address to that body:

"Provision for Aged Members.—So many instances of aged and invalid dentists seeking assistance from professional confreres have presented themselves to my notice, that I have long entertained the thought that it would be a good thing to raise a fund in our Association to be used for their maintenance. I have talked with a few of our members, and all seemed to think well of it, but no one has offered a practical suggestion as to the ways and means for raising the money.

"If we could increase our membership to several thousand we might, in the course of time, accumulate a surplus fund, as the American Musical Association has done. It is said that it has a surplus of \$60,000 in the treasury.

"Do we need to wait so long for the accomplishment of an object so desirable and so beneficent?

"I think a fund for this purpose could be started by subscription. When the profession wanted money to fight frauds, it was promptly raised, and nobody who gave to the cause ever missed the contribution.

\*Read before the Kentucky State Dental Society, 1911.



"If I could succeed in enlisting your interest in this cause, you would raise \$20,000 before this meeting adjourns.

"I would suggest that a committee be appointed to solicit subscriptions to this fund, and that the chairman of this committee be the treasurer, and that he be required to give a bond for the safety of the fund.

"This committee should be ever active and diligent in soliciting funds for this object. Each State Society should be encouraged to appoint a committee to prosecute the work, and the funds raised in the State Societies should be paid annually, or oftener, into the hands of the treasurer of the parent committee.

"It should be the policy to invest this money in safe and reliable securities and use only the interest in alleviating the wants of those aged members applying for our charity."

I will not quote further, but will say that the idea seemed to be most heartily approved by the Association; however, my plan not being well matured, and probably because it was not a practical one, nothing was done.

It met the fate of many preceding presidential suggestions — died — and was completely buried in the memories of the members of the Association.

The last year has produced its crop of misfortunes just as in the past, and while some of these are thrilling and vibrating our chords of sympathy, and at the very moment our friends are asking aid for our beloved unfortunates, I have determined to resuscitate my dormant idea, and this time I feel that I shall be able to breathe into it a life that shall persist, grow, develop, and bear fruit.

This time I propose a plan that is practical, simple and sensible. Instead of starting in the head or top of the tree, I shall start with the roots; instead of in the National Dental Association, I propose to start the movement in the State Associations; and my plan is as follows:

Let each State Society increase the annual dues \$1.00 for each member, and let the additional \$1.00 thus obtained be turned over to a committee to be known as the Benevolent Committee.

I would suggest that this committee should consist of three members, and that they be elected by ballot, the senior one to serve three years and the junior members to serve one and two years respectively, so that at each annual election there will be one place to fill on this committee.

It shall be the duty of this committee to take care of the Benevolent Fund, to solicit subscriptions to it whenever and wherever in their judgment they are likely to be obtained, to receive any donations or legacies that may come to their care, and to report to a parent committee in the National Dental Association any cases of distress among our members that, in their judgment, are in need of and deserving our attention; paying over annually the money collected during the year.

This plan will be carried up to the National Dental Association at

Cleveland, and if it meets with the approval of that body a parent committee will be elected, whose duty it will be to act in the capacity of parent benevolent committee and push the organization of this work in all State Societies (in local societies as well if they choose to enter upon the work), until all become co-laborers and sharers in the benefits of this organization.

Local societies entering this work are to make annual reports and payments of funds into the hands of the state committees; and these in turn are to make annual report to the National Committee; which latter committee is to be placed under bond for the safeguarding of the fund.

Now, let us see how the fund may be expected to grow if we complete the organization and collect \$1.00 a year from each of our members.

There are about forty-seven states. If each state organizes a dental society, with the populous Eastern and Northern Societies of long standing, many of which now number several hundred members, I believe it is safe to say we shall soon average 100 members for each State Association. This would give us 4,700 members, worth as many dollars annually to our benevolent fund.

This fund, if wisely husbanded, should grow from year to year into a very strong bank, yielding a goodly interest to take care of our unfortunates.

The methods of the parent committee in managing the money should be such as are followed by insurance companies and such like benevolent organizations; in short, methods that are safe, sane, and yielding such return of interest as may be realized from safe investments.

It is my earnest belief that such an organization as I have outlined will add more members to our state and local societies and to our National Association than anything else we can do.

If we put enthusiasm into our efforts and honest work behind our enthusiasm, there is no telling what we may do in this line. Success once assured begets more success. A goodly fund once established will grow very rapidly, and wise management will be sure, in the course of time, to attract some considerable legacies; but we need not indulge in dreams like Alnascar's to arrive at figures well calculated to stimulate us to our best efforts.

I do not offer the above plan as a perfect one — perfection is seldom attained, and in efforts like this can only be reached, if ever, after years of trial.

It is my hope that some of you who have business ability will promptly suggest improvements. At least, I hope you will think well enough of the movement to accept it as one worthy of our best efforts, and that you will regard it as a duty that rests upon us as individuals, as well as in our associated capacity.

#### DISCUSSION.

Dr. H. B. Tileston opened the discussion upon Dr. Noel's paper by expressing himself to the effect that he considered it a great move and one in which all of the dentists would be more or less interested, as no one could foretell what the future

had in store for them, and that the ones who at this meeting were the least interested in the move would probably be the first ones in need of such support. He expressed himself as being heartily in favor of the plan and suggested that the matter, in order to be presented before the society in due form, be put as a motion, to the effect that the general plan of providing for old dentists, as outlined to the body by Dr. Noel's paper, be adopted by the society; seconded by Dr. O. G. Wilson.

The paper was further discussed thoroughly by Drs. Barr, Rose and Tileston; after which the question was called for. At this time a motion was made by Dr. Max M. Eble to amend Dr. Tileston's motion, to the effect that the general plan of Dr. Noel's paper be endorsed by the Kentucky State Dental Association, and as the working plan of this paper had not been carried out, that our society should hold itself in readiness to act upon such plan when the other state societies, national, etc., should accept and endorse such a plan, but at this time we take no definite action regarding same. The president appointed Drs. Becker, Pirtle and Kellogg upon a committee to take under consideration and advisement the paper and report back to the society the feasibility and practicability of the plan for providing for old dentists as presented through Dr. Noel's paper.

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## RANDOM THOUGHTS AND COMMENTS UPON THE PRESENT AND FUTURE STATUS OF DENTAL SURGERY AND DENTAL ART, WITH SOME SUGGESTIONS FOR THE POSSIBLE GOOD OF OUR STATE SOCIETY.\*

By Dr. O. G. Wilson, Owensboro, Ky.

ON ALL sides and in every direction we are confronted with ample evidence of the fact that dental surgery and dental art are in touch and keeping pace with the spirit of progress that characterizes this twentieth century.

Wonderful strides in advancement and achievement in invention are visible in every branch, and day by day we note *new methods* and *new things* to aid us on our upward march, while brainy and indefatigable men with deftness of trained and skilled hands, and backed by intellects born of genius, give us still of the fruits of their labors, and are asking that we make our further wants known unto them.

Difficulties are daily being overcome, one by one. The *impossible* of yesterday is no longer so; the *complex* is reduced to the *simple*; the *obscure* brought to our *clear visions*; barriers are broken down; briars and thorns cleared out of the way; crooked paths made straight; the blind made to see; the deaf to hear; and the lame made to walk in this veritable day of miracles and progress born of genius indeed.

And yet the half has not been told of the wonderful things that the future is holding in store for the visions of the oncoming generation, if the past be taken as a safe standard for guiding our prophecies. We may safely conclude that dentistry is as yet in its infancy and scarcely out of its swaddling clothes.

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\*President's address at Kentucky State Dental Society, 1911.



We wonder what our forefathers and patriarchs would say could they come forth from their graves for a moment and view the work crudely begun by their hands. To them, no doubt, it would seem wonderful, to us at least gratifying, while to the future generation our present achievements will largely have dwindled into insignificance by reason of what must yet come to light through advantages already gained and by means of increased enlightenment and a further touch of the Aladdin lamp.

An illustration of our progress may readily be had by turning back five or ten years the files of any of our leading journals. By this we are reminded of the great changes constantly occurring, and are forcibly struck with the difference between methods and teachings in vogue at that time and those that are talked of today. A further turning back to twenty or twenty-five years brings to mind the reasonableness of the story of Rip Van Winkle. Truly we live, and move, and marvel, as we go on and on.

Look at the contributions of dental surgery to the schools of medicine and surgery, chemistry, bacteriology, metallurgy, science, art, invention, with that of anatomy of the human tooth by Black (the most complete technical work of the human tooth the world has been given), the technical demonstration of the laws that govern the mandible and its use and function, and bearing upon the important relation to normality in man, as well as animal, with facts determined concerning the function of mastication and establishment of laws relating thereto. The relation also between departures from normal occlusion with attending ills, and distortion of the human face and features; schools of orthodontia manned by learned and trained brains and hands to remedy defects of the jaws and teeth in relation to feature and expression, to say nothing of their bearing upon health.

Scientific data and facts that are of such vital importance to knowledge as to command the respect of scientific men of every school of learning the world over, have been evolved from orthodontia alone, and the names of such men as Black, Bonwill, Miller, Angle, and scores of others that might be named, will go down to adorn history's page so long as history shall be history. These men of beloved renown and revered memory, whom we are proud to own, were from the ranks of the dental profession.

Such men never worried a moment about whether the profession of dentistry should be regarded as a branch of medicine, nor whether or not recognition from the medical ranks would be necessary for the world to first see before placing its approval or its ban upon the work of their hands. They were content, because of their wisdom and foresight, to allow the world to place the laurel where it belonged. Truly we of our beloved profession of today have much to be thankful for, and our pride is deeply touched with this thought.

This idea of medical recognition, while paying a worthy homage to a great and noble calling, to the mind of your humble essayist, has never been necessary nor timely in all the fulness of its meaning. When we stop to consider the multifarious branches constituting the profession of dentistry,

which has for its province not only the treatment or relief of suffering or disease, or that of its prevention (and which allies us to them as members of the healing art), but must deal largely with the esthetic requirements of our calling and partake thereby of the calling of the artisan; while, when orthodontia is considered, we do not treat *disease* but *abnormality*. Abnormality of the jaws, producing a malocclusion of the teeth, could not be characterized as a *disease* any more than the comparison between that of the limbs of an individual, one of which is shorter or longer than the other. One would not call a *dwarf* diseased, because of his stature, nor a *hunch-back* so because of his bent frame alone. All these are but *abnormalities*, and might be results from disease, or accident, while enjoying perfect health at this time. Hence we conclude we are in error to apply to the orthodontist that meaning for his calling that would fail to properly define it. Surely no one would send for him to treat a case of typhoid or to remove a limb. Ascribe to him all honor and praise and glory for the sake of his noble calling and for his work done for the "human face divine," but do not send for him when you would have your precious appendix removed. He is not the man for this kind of work.

It must be admitted that orthodontia has proven itself to be a science that has and is giving to the world some wonderful discoveries concerning the human jaws and face, and we pay tribute of homage of the highest order to the *thought*, while our pride exults to overflowing as we view this child as the offspring of our own parentage.

Whether or not the dental profession should be recognized by our worthy compeer, medicine, does not trouble me. I view it, perhaps, in a different light from many, regarding the matter as one of a subject for complex analysis when I consider the multiform branches that are specializing every day, and new ones springing into existence by reason of necessity arising, any one of which, in order to a proper fitting, must require one's individual time and attention, since life is short and opportunities often meager.

When we view the field that lies out before us, and the possibilities that remain for the *busy* and *untiring*, who have humanity's good at stake, we are content with the pursuit of our calling which has its own peculiar field of work that must be done by us, because we, of all others, are by reasons peculiar to our training and fitness, the ones best suited for the work demanded. And when the same shall have been accomplished and shown to the world, not only will the medical profession, but all others of every kilt, with those of humanity, the world over, place upon our heads a *crown* and *diadem* for our work well done. Recognition will always be given when and where it is deserved. We cannot expect a full recognition for our profession with its ranks filled with the good, bad and indifferent, and including the horde of charlatans with their daily emblazoned headlines and flaring display of quackery flaunted in the faces of an intelligent public through the medium of the public prints, and reminding them that they, too, belong to the dental ranks. These are barriers that must forever

militate against us as a whole, as a profession, in the eyes of intelligent critics, and we need not expect better things until a pruning out is well had and the barnacles clinging to our sides have been removed; until the house has been *completely garnished*.

The ranks of the medical profession are well permeated with this character of black sheep, whether more so or less so matters not; but they, as well as we, shut them from their doors because they are spurious and counterfeit.

The medical profession, however, has such a better hold upon the people, and legislators, that they have exercised a better control over the quack, and in many states they have enacted laws that control the situation well, and no doubt this work will grow with education of the masses.

*Legislation* is, therefore, the keynote of this evil and must come to *our rally* before we can cope with it. The devil must be fought with fire, and the warfare *well waged with constant vigil in order to keep him within even reasonable check*. Again, the ethical conduct of some within the fold of our societies might bear looking into, and some given a dose of such physic as will tend to purify the body politic. Societies are too careless about passing upon credentials of applicants, and voting them in oftentimes; the fear of *debar* working a greater injury to the society than their admissions, seems to our mind about on a parallel with the letting of a wolf within the sheepfold. Our judgment is not always wise, but in this instance we would be inclined to favor the safety of the sheep if the wolf were kept out, certainly not by letting him in where he could despoil. To such end, societies everywhere should have a permanent ethical tribunal composed of men who would see to the duties of their office well, and to such should every application of membership first be handed and passed upon after a full investigation of the character of the applicant, weeks and months before final admission into our ranks; said tribunal might also alone be the sole arbiters for trial of all infractions of the moral or ethical code, and before whom such matters could be brought without the exposition of any matters pertaining to their business coming before the association except upon the safeguard of appeal from their court. A trial had before such tribunal might result in such character of reprimand as to have the effect of saving, rather than destroying, the leaven of good in some, while *reprobates* and *incorrigibles* could be cast into "outer darkness, where there is weeping and wailing and gnashing of teeth."

We are pleased in this connection to acknowledge our appreciation of a small *slice* of legislation in our favor within the present year in dealing with the "parlor men." This again suggests another thought regarding legislation and the seeming existing necessity for invoking its aid in every important matter that relates to dealing with the public mind when matters of health are sought to be put into general use for the public good, since no measure of this kind has ever made any headway without it. This brings us to the question of *oral hygiene*, today upon the tongue of every dental body the world over, with more space devoted to its discussion in societies and in our journals, *ten times*, than any subject that has ever



stirred our profession. One cannot pick up a journal but what he is confronted with this *subject of all subjects* before the *dental mind*, and every writer or thinker has some attempted solution, or aid to the solution of the one problem as to *how* we are to put this theory into practical working form, so that we may reform, as it must undoubtedly do, the human race wherever its civilizing power shall have been made known.

*Legislation* here must be the *logical* aid for propagating this life-saving and disease-preventing power, and in our judgment there is no other way to expect it.

To obtain this desired legislation brings up another problem for solution that begins with the word "how."

Our analysis, as it occurs to us, shall be *brief* but to the point. I shall answer by a phrase "*education for legislation.*" This education must include first, the medical profession, and second the public, which includes those who go to our capitol to make the laws. The medical profession must be shown the *truth* of our claims for oral hygiene, and oral health, and its bearing *upon prevention of diseases*. They must not only be shown the *truth of evidence* to support our claims, but they must also be impressed with the better status of our professional ability and learning to risk the oversight of this matter entirely in our hands. When such has been made known to them, they are too great and noble a body of men to fail us in their aid towards the adoption of a law that will COMPEL *every teacher in every public school in our land to daily teach the coming generation the wisdom for the intelligent use of the brush, and instruct them in the importance of caring for their teeth. Oral hygiene must be taught in connection with physiology in every public school or become embodied in a text-book for this purpose.* It may be a while yet before this comes, but *it must come*, for "the truth shall be known and the truth shall make us free."

When the dental profession shall have been the *means and sponsor* for having had ingrafted into the *muscle and fibre*, and the *bone and sinew* of civilization, the subject of ORAL HEALTH, we may be able to point with our finger of pride and say to the world, "behold what we have done for the human race," by shutting out from the *body* so much of disease and suffering, and have saved more lives by so doing than all the schools of the healing art since the world began. We shall then have established our claim upon the world as its greatest benefactor, having demonstrated that great principle that *prevention of disease is better and safer to be relied on than its cure.*

For the honor shown by you in your selection of me as your president and for the privilege of even feebly serving you in such capacity and the pleasure the same has brought with it, I can find but feeble words to thank you, but my gratitude and appreciation is deeply felt if but poorly expressed.

My parting words shall be expressed in the hope that the Kentucky State Dental Association may continue to reflect that honor that is due from it as the champion of the great and noble cause of dentistry.

# CORRESPONDENCE

## THE DISAPPEARING MODEL.

Dr. A. T. Rasmussen, LaCrosse, Wis.

The writer feels it his duty to call attention to a very misleading and incorrect statement made by Dr. Dayton Dunbar Campbell in the January, 1912, number of *THE DENTAL SUMMARY*.

In an article entitled "Campbell's Cow-Bell Method of Casting Plates," the author describes his method of procedure in making a cast aluminum plate. After carrying the case along to where he says "the bell is now placed on a *slow fire* and the *wax* burned out," he proceeds further by saying:

"This idea of the disappearing model, of course, belongs to Dr. Taggart, and it is to him that all credit should be given should this article prove beneficial to you."

It is this statement regarding the disappearing model that I wish to comment upon. I believe that Dr. Campbell is perfectly sincere in saying what he does and that he is simply misinformed regarding the origin of this method of removing the model from the investment.

That the idea of the disappearing model is as old or older than dentistry itself and that it was used in the arts when the practice of dentistry was practically an unknown quantity, has been ably shown by other writers, and I shall confine myself to the principle as applied to dentistry and more especially to the making of base plates for artificial dentures.

I do not know, nor is it of very much importance to know, who first used this idea of the disappearing model in dentistry, but of this I am aware, that in 1900, to my personal knowledge, it was being used and taught in Northwestern University Dental School by Dr. Prothero and his assistants.

Further than this, in *Prosthetic Dentistry*, by James Harrison Prothero, published in 1904, on page 145, the author describes the method of casting aluminum plates.

In paragraph 280 he says: "It is unnecessary to open (the flask) for the removal of the wax, providing the gates are open and free, for upon heating the wax will disappear in the investment."

In paragraph 281 he says: "Sometimes air pressure is used to assist in forcing the metal into place," etc.

This was taught to hundreds of students in the Northwestern and may have been in other dental schools, but of this I have not direct knowledge.

Inasmuch as this method of procedure was being taught regularly, as shown above, it does not seem fair that "all credit" should be given some one who later becomes an exponent of the same principle and methods.

I have never heard Dr. Prothero say that he or anyone else was the originator of this idea, but on the other hand he simply gave it to the student body as a well-established fact.

In making cast metal base plates for lower dentures, of the heavier alloys, I have always used the disappearing model. In this I lay no claim to originality, inasmuch as I did it first when in school as a student. It was a very simple matter to draw the conclusion that the model would disappear in the latter case, as well as in the former.

While, of course, it is not nearly as important to know who first applied this principle to the practice of dentistry as it is to properly use it, yet I trust that the above will prove of interest to those members of the profession who were not cognizant of these facts and that it will, to some extent, correct the misconception which is largely prevalent among the profession.

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The Ransom & Randolph Co.,                      Washington, D. C., Feb. 10, 1912.  
Toledo, Ohio.

Gentlemen:

I am enclosing statement prepared by Mr. Fred B. Rhodes, attorney for the defendant in the Taggart-Boynton suit, and desire that you publish same in the next issue of THE DENTAL SUMMARY as a matter of general information to the dental profession.

The Taggart-Boynton suit was argued on January 3, 1912, in the Supreme Court of the District of Columbia, and a decision was rendered on February 6, 1912, sustaining the patent. On February 9, 1912, ensued the noting of appeal to the Court of Appeals which is covered by the statement of Mr. Rhodes.

Sincerely yours,      M. F. FINLEY,  
Chairman Committee of Defense.

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Dr. George W. Boynton yesterday noted an appeal to the Court of Appeals in the Taggart case and filed a supersedeas bond required by the rules of the court.

The court has issued no injunction or restraining order, restraining Dr. Boynton or any other dentist from practicing the inlay process upon which he was sued, nor can any such order be issued until the final hearing of the case before the Court of Appeals. It will be at least three or four months before this case will be heard by the Court of Appeals and finally decided.

As both sides to this controversy had stated to the court that an appeal would be taken if the decision were adverse, the lower court did not consider it necessary in its decision to go into the question of the evidence taken by both sides, but simply announced from the bench that he had decided in favor of sustaining the patent.

F. B. RHODES,  
Attorney for Defendant.



A decorative border featuring a repeating pattern of stylized flowers and leaves, framing the central title.

# EDITORIAL

## STUFFING AND STUFF.

In the last issue of this journal we published an article entitled "The Dentist Guardian to the Gateway of Nutrition," by Dr. S. M. Stauffer, and if there are any of our readers who have not read the article we urge them to do so. It contains pertinent facts regarding our mode of living.

Too little attention is given to diet by the great majority of people. Comparatively few seem to realize that there can be intemperance in eating as well as in drinking, and fully as many, if not more, people die from the effects of overeating or injudicious selection of food than from alcoholic drinks.

Nature has provided us with wonderful bodies, but as complex and wonderful as they are, there is a limit to their endurance. They stand much punishment and abuse from gluttony and injudicious eating, but they can be overworked until the powers of digestion, assimilation and elimination become weakened — and then comes disease. Overindulgence in foods, or stuffing, is to clog the system with a mass of stuff that taxes and overtaxes the capacity of the cells of appropriation and elimination. Even the stomach of a cast iron and steel engine couldn't endure it and give good service. Suppose the fireman should shovel into the firebox of his engine all kinds of coal, large and fine, wood, peat and coke, until he had it crammed full of the mixture. What would be the result? Incomplete combustion and elimination. The flues would be choked with soot and waste; the engine would not get the full benefit of the material used as fuel, it would be slow in making steam; clinkers would form and the draft be checked, etc. No engineer would stand for such abuse of his engine, and yet every day people abuse their bodies, their greatest possessions here, in like manner.

We can get a good lesson from the stoker. The first thing done is the selection of good steaming coal, one that gives good heat but that does not produce an undue amount of carbon during good combustion, and one that does not burn too rapidly and that does not form an extra amount of clinkers. The first thing, then, is the careful selection of the fuel for the engine to eat. Then comes the feeding to obtain most efficient service and least impairment of the working parts. The fire is started and fuel added little by little until the engine is steamed up. Now see what the stoker does to get the most complete combustion and elimination. Instead of shoveling a great mass of coal into the firebox at a time, which would have a tendency to check combustion, he feeds but a little at a time, spreading

it about over the coals so as not to retard combustion, but on the other hand to get as nearly perfect combustion as possible and consequently the most perfect elimination of the least amount of residue. The result is a well maintained head of steam, as nearly complete incineration of fuel as possible and elimination of carbon waste so complete that little or no clogging of the working parts results.

Don't do to your stomach what an engineer would not allow to be done to the cast iron stomach of his engine. Select your food according to your needs, eat less at a time but sufficient to keep up a supply for the demands of the working cells. Don't choke the human machinery by stuffing with stuff that at best is only fit for elimination or that will clog the processes of digestion and assimilation or overtax the cells and organs of elimination. Less food, more judiciously selected, plenty of pure water to drink, fresh air to breathe and a suitable amount of exercise in the open air each day are better than a "bilious" stomach, tired body and brain, or a torpid liver and grouchy disposition.

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### RESOLVES WORTH WHILE

A church, no matter where, prints on its program of services these words:

*I will not worry.*

*I will not be afraid.*

*I will not give way to anger.*

*I will not yield to jealousy, envy or hatred.*

*I will be kind to every man, woman and child with whom I come in contact.*

*I will be cheerful and hopeful.*

*I will trust in God and bravely face the future.*

Read them again. They are words worth while. They're fine for the New Year.

Cut them out and pin them where you will see them often.

We refrain from any comment on these resolves, because they say for themselves a thousand times more than we could, even though we used every word in the dictionary.

---

### TO LOCATE ROOT CANALS

To assist in locating the opening to a root canal which has been temporarily obliterated by the process of decay having entered the pulp chamber, moisten with alcohol and dry with warm air. The tooth structure turns white, but the entrance to the root canals is indicated by the small dark spots. This often saves time by cutting down the area to be explored.—E. S. Best, Minneapolis.—*The Dental Review*.

# OBITUARY

On December 11, 1911, occurred the death of Dr. J. C. Corcoran, one of the foremost men of our profession in the state. He was born in 1863 in Corcoran, Minn., a town named after his father, graduated from the Ohio State Dental College with honor in 1886 and has since been considered one of the best operators. His loss is felt keenly by the profession and the following resolutions have been drawn up by the Minnesota State Dental Association in appreciation of him:

“IN MEMORIAM.”

## RESOLUTIONS

WHEREAS, It has pleased Almighty God, in His providence, to remove from our midst and from this earth our esteemed brother, Dr. J. C. Corcoran, who departed this life December 11, 1911; and

WHEREAS, By his death the commonwealth has lost a citizen of the highest type and the profession an eminent and highly respected member, who throughout his career was among the foremost working for the advancement of his fellow-men; and

WHEREAS, By his death the Minnesota State Dental Association has sustained an irreparable loss; therefore be it

*Resolved*, That we, the Minnesota Dental Association, feeling the loss we have sustained keenly, hereby express our sorrow over the sudden culmination of Dr. J. C. Corcoran's noble career; and be it further

*Resolved*, That a copy of these resolutions be spread upon the minutes of this association and a copy be sent to the bereaved family and to the journals for publication.

F. J. YERKE,  
G. F. ANDREWS,  
J. M. WALLS,

*Committee.*

---

## THE IMPORTANCE OF THE PURITY OF GOLD IN SWAGED GOLD PLATES

In the stamping of a gold plate, if the counter-die is lead, the greatest care must be used to avoid the presence of lead in the gold plate. If by accident lead is found in the plate, it is to be remembered that hydrochloric acid will not dissolve the lead, which must be rubbed off the plate with a cone and pumice powder, or the plate immersed in nitric acid before heating up. A gold plate must not be annealed until all traces of lead are removed from it.

Particular care must be taken to select gold for backing which is beyond suspicion. The gold scrap cut from the stamped plate may be impure.

If the dentist melts his own gold or gold solder, he must be certain that no trace of lead is left in the metal. The rollers, also, must never be used for rolling base metal, *i. e.* lead.

It is not an uncommon habit of workmen to rapidly cool a gold denture by covering it with casting sand. This is dangerous, as such sand commonly contains traces of lead.—W. Simms, *Dental Record*.

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## TO MAKE A HARD PLASTER MODEL

One part of Portland cement mixed with twenty parts of plaster of Paris will make a perfectly hard model cast.—*Chemist and Druggist*,



# NEW PUBLICATIONS

*Development Pathology, a Study in Degenerative Evolution.* By Eugene S. Talbot, M. S., D. D. S., M. D., L.L.D., Professor of Stomatology, Bennett Medical College (Loyola University), Corresponding Member Budapest Royal Society of Physicians, Honorary President International Association of Stomatology, 1907, Paris. Boston: Richard G. Badger, Pub., 1911. Price, \$6.00.

In the author's words, the object of this book, tersely stated, is to show: First, that the autogeny of man, his structure and organs, is a modified recapitulation of his phylogeny in development. Second, that as the vertebral phase appears early in embryogeny, an unstable nervous system checked by parental defects, eruptive fevers and other agencies at the periods of stress in the child affects phylogeny and autogeny. The paramount practical purpose of the book, therefore, is to correct current erroneous conceptions of heredity, by showing that neither excessive nor arrested development is inherited directly from the parent. Children born with structures and organs which exhibit a departure from the type, are said to inherit these defects. Upon investigation, however, none of the defects are to be found in the family for generations; in the seeming default of heredity to account for the departures from the type, the ordinary mind fails to understand them. The real key to the situation lies in the truth that human heredity cannot be considered to any purpose without taking into account intrauterine education, environment and development. With the object of presenting these conditions in their proper relationship this work is offered. The first chapter treats the nature of Living Beings, followed by chapters on: The Development of Man, Development of Organs, the brain, heart, great arteries, the liver, kidney, head and face, Periods of Stress, An Unstable Nervous System the Cause of Nutritive Disturbances, Checks on Excessive Action Not Properly Developed, An Unstable Nervous System the Cause of Nutritive Disturbances, Checks on Excessive Action Weakened, Nervous Effects of Relaxed Check Action, Constitutional Degeneracies due to Check Action: of Normal Structures in Man's Present Evolution. Constitutional Degeneracies due to Decreased Check Action: of Structures that have Passed in Man's Present Evolution. Constitutional Degeneracies due to Check Action: of Structures that are Passing in Man's Present Evolution. The Nose; Maxillary Sinuses; Jaws; Dental Arches; Alveolar Process; Interstitial Gingivitis; Endarteritis Obliterous and Calcic Deposits; Pus Infection; the Vault; Cleft Palate and Harelip; Vertebrate Teeth; Phylogeny and Autogeny of Tooth Development; Autogeny of Human Teeth; Dental Pulp; Effects of Pulp Diseases on Tooth Structure.

The text shows a great amount of research, but Dr. Talbot has been working along these lines for many years and is probably the best fitted man in the profession today to prepare such a treatise.

The work is a valuable addition to our literature on a subject that dentists generally should better understand, and it should find a large sale in the profession.

The text covers 434 pages and is profusely illustrated with 346 engravings. The typography, printing and binding are all that could be desired, and the author and publishers are to be congratulated on the production of such a valuable book.

*A Text-book of Dental Histology and Embryology, including Laboratory Directions.* By Frederick B. Noyes, B. A., D. D. S., Professor of Histology, Northwestern University Dental School, Chicago. 12mo, 510 pages, with 350 illustrations and 19 plates. Cloth, \$4.50 net. Lea & Febiger, Philadelphia and New York, 1912.

This is another of the series of excellent text-books being published by this well-known house. The author is recognized as one of the foremost students of histology in the dental profession and has taught the branch fifteen years in the Northwestern Dental College. Well fitted for the task, he has prepared a treatise on a subject that is of the greatest value to every dentist, and has prepared it from the standpoint of the dentist.

The author states that the object of a course in general and special histology suited to the needs of dental students is to convey a definite knowledge of the activities of these parts of the human body in tissues and cells. This is the basis of every practical procedure. The structure of the enamel and dentine is obviously the starting point in handling these tissues and in the preparation of cavities, and the structure and function of the pulp, the bone, the periosteum and the peridental membrane are similarly the basis for an understanding of their pathology and treatment. The study of the enamel in relation to cavity preparation has proved to be of the greatest value not only in forming better cavity walls but also in facilitating operation. For this purpose it is necessary to understand both the structure of the enamel in itself and the arrangement of the structural elements in relation to the tooth crown.

The modern dentist, while looking at the surface of a tooth, must think of the enamel in terms of its structural elements and use this knowledge in handling the tissue. In the book the enamel is studied primarily in relation to operative dentistry.

The chapters on pulp, peridental membrane and periosteum are likewise intended to emphasize the relation of structure to function and to impress the idea that the treatment of disease in these tissues is in every instance a biological problem.

In forming true conceptions of caries and necrosis, a knowledge of the intercellular substances and their relation to the cells in the structure and function of tissues is necessary and a chapter has been devoted to this subject. The author has covered the whole field of dental histology very thoroughly and has added chapters on embryology and development of the face. He has also embodied a laboratory course and directions for technic. The illustrations are abundant and mostly original. It is a most excellent work and every dentist should possess a copy.

## SOCIETY ANNOUNCEMENTS

### SOUTHERN MINNESOTA DENTAL SOCIETY.

The twenty-seventh annual meeting of the Southern Minnesota Dental Society will be held at Mankato, Minn., April 8, 9 and 10, 1912. Programs will be issued in due time.

C. A. HINTZ, *Sec'y.*

### TENNESSEE STATE DENTAL ASSOCIATION.

The forty-fifth annual meeting of the Tennessee State Dental Association will be held at Memphis, Tenn., in the Business Men's Club Rooms June 6, 7 and 8, 1912. The Business Men's Club extends the courtesies of the club to all the visiting dentists, and the association invites all ethical dentists to attend.

CHAS. A. TAVEL, *Pres.*  
J. L. MANIRE, *Sec'y.*

Des Moines Iowa, Feb. 14, 1912.

The Alumni Clinic Committee of the University of Iowa has abandoned the annual alumni clinic for 1912. This has been done with the idea of increasing the interest and attendance of the Golden Anniversary of the Iowa State Dental Society. This, together with the postponement of the Midwinter Clinic of the G. V. Black Club of St. Paul, Minn., should double the attendance at the State Society meeting at Des Moines, May 7, 8, 9 and 10.

# THE DENTAL SUMMARY

The Magazine That Helps

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The Michigan State Dental Society  
The Indiana State Dental Society  
The Kentucky State Dental Society  
The Louisiana State Dental Society  
The West Virginia State Dental Society

The Northern Ohio Dental Society  
The Northern Indiana Dental Association  
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## GENERAL NUTRITION OF CHILDREN\*

By Phelps G. Hurford, M. D., Saint Louis, Mo.

Instructor in Pediatrics, Washington University Medical College, Visiting Physician  
St. Louis Children's Hospital.

I N PRESENTING a paper before a body of dentists one is naturally inclined to strain himself to bring the subject into the closest possible relation to the teeth. That makes the audience feel quite at home, no matter how far astray the essayist himself may be. I will therefore start quite frankly and jump at once into deep water, trusting it may prove to be not quite over my head; not, however, without a certain measure of doubt about it. During the discussion which follows I hope to learn something that will help me out in giving the teeth their proper place in the nutritional disorders of children.

\*Read before the St. Louis Society of Dental Science.



In taking the histories of infants and children whom we are examining for the first time, it is surprising how often we feel the importance of asking when the child got its first teeth. Not infrequently one of the first evidences of improper or delayed development in a baby is the failure of the teeth to erupt according to schedule. The time of eruption is subject to such wide variation, even in babies apparently healthy and well fed, that it often means little or nothing at all. But often a poor state of nutrition is suspected by the parents because the teeth do not come through when it is thought they should. This, fortunately, leads them to consult a physician, and the same fact is of some value to him in determining the lack of development.

Then there are older children who present a condition, commonly seen, that shows a vicious cycle of indigestion and decayed teeth: one of these conditions is present, or both. Under proper attention the digestion gets along fairly well, only to be halted because of the teeth and the inability of the child to properly masticate its food. By the time the teeth have been put in good condition, the stomach is out of order and soon the process of decay begins again in the teeth. I firmly believe that many cases of chronic indigestion are given a strong hold in just this way. If both ailments were attended to at once, and treated as though they were one, the results would be far more satisfactory. For many failures both physicians and dentists are to blame, but many do not materially improve under the best and most careful treatment.

As a legitimate item of evidence of the importance of proper feeding and general nutritional measures in childhood, I wish to cite a few brief and only approximate facts.

In the tabulation of death rates in the large cities, it appears that of all deaths, from all causes and at all ages, 25 per cent. occur under one year. Of all babies born at full term, and naturally entitled to live, 15½ per cent. die in the first year of life. Putting the birth rate of St. Louis at the conservative estimate of 16,000, this means that in one year 2,400 babies die in the first 12 months. And the deplorable part of it is that a startling percentage of these deaths are now conceded to be readily preventable. About one-third of them are due to gastro-intestinal disorders, and of these we are firmly convinced that 30 per cent. are due to improper or insufficient food, or to ignorance in the feeding. That is to say, there are nearly 300 babies who die in this city every year from what may be properly called neglect. And not neglect on the part of the parents, but which can only be charged to the municipality and to society in general. The statement that we pay more attention to the welfare of our cattle, hogs, chickens, etc., while it may be true, is rather misleading and doesn't get us anywhere. Nor, on the other hand, does the comfortable theory, just as true, of the survival of the fittest have any place in the discussion.

During the later years the nutritional disorders have less place, though we still see cases of malnutrition that can be directly traced to stomach and intestinal troubles in infancy. They don't all die when infants.

In infancy, at the time when proper development is most needful and when it is most difficult to direct, the greatest errors are met and the most grievous ignorance shown. Babies are neglected in the matters of air, exercise and of sensible care during acute illness, to a much greater extent than are older children.

But in later years many cases of malnutrition are seen which are due to poor air, too little out-door exercise, improper feeding during some acute disease, and to too absorbing school work. In other words, are due to a number of things that are easily preventable by the use of common sense and good judgment.

Most anyone would recognize an ordinary case of malnutrition in infancy. But I wish to mention one sort that often masquerades in the garb of health, and is of the greatest importance. It is due directly to improper feeding, though the victims are often over-fed. This is rickets, the disease of crooked bones, flabby muscles and delayed teeth; the disease of patent foods and condensed milk. Not that all cases are due to the use of those articles; but so many of them are as to make us very cautious in their use. Even those children that show no marked indications of this disease, prove exceedingly susceptible to diseases which other children throw off readily enough.

Malnutrition in older children has no particular signs that he who runs may read. The general appearance is simply not up to par. They may be thin or only pale, or there is a general impression of incapacity without thinness or noticeable pallor. They are apt to take cold easily, to be subject to numerous minor ailments that are thought to be due to nervousness, to the kidneys, lungs, etc.; frequently they are thought to have tuberculosis. They are apt to be easily excited, and generally gain very slowly in weight. It is remarkable what results follow the enforcement of certain simple rules and regulations in many of these cases.

I purpose reciting the ordinary nutritional measures that should start a baby out right and keep him well as far as his general nutrition is concerned. All babies should be trained to take nourishment at regular intervals, to sleep regularly, to have plenty of fresh air and the proper means of exercising. The latter is very simply cared for by loose and light clothing. Few babies are dressed too lightly.

If not breast-fed, the milk should be clean, as fresh as possible, and properly modified to approximate the mother's milk. At the end of the first year the child should be weaned and gradually given simple foods to replace some of the milk, and still fed with strict regularity five times a day. Older children can gradually be made to take only four and then three meals a day, and the same regularity in habits is essential.

A child, and more especially a baby, should never be given a dose of medicine of any kind without a definite indication. Exercise for a baby simply means being allowed to wave the arms and kick the legs; the occasional crying that is beneficial is never lacking. With older children, exercise is best obtained by out-door playing, and generally out-door games fill the indication best—if not too exciting.

Lessons and school study should never be burdensome, and reading only moderately indulged in.

Bathing is to be moderate or immoderate, according to one's ideas of cleanliness; few children are bathed too much. Scrupulous cleanliness of the mouth and teeth hardly needs mentioning.

Playrooms and sleeping rooms should be perfectly ventilated and not over 70 degrees in the daytime or over 60 degrees at night—50 degrees is still better.

The idea that a child needs a great variation in diet is a mistaken one, and simple food, clean and well prepared, taken regularly and in moderation, is the best diet. A child should never be bribed or forced to eat, particularly when there is evident some slight indisposition. And practically every child needs less to eat in the summer than in the colder months.

These cardinal rules are simple; it seems foolish to speak of some of them, so well are they known. And yet it is astonishing how often they are violated in every particular. They comprise general nutrition in childhood. And persistent disregard of any one of them, especially of food, air and sleep, will surely result in trouble, mild or severe.

As to the proper diet in the different years. In the first year it is safe to remember that the food should be milk. Generally by the ninth month it is best to begin giving starch in some gruel, as of oatmeal, barley or arrowroot; and a little orange juice and beef juice every day. Most of the acute disorders of the stomach and intestines during this period and the second year are due to giving solid food too early or in too great quantity. In the second year milk should still form the great bulk of the food, but it should be taken from a cup, not from a bottle. The bottle habit is easily acquired and hard to dislodge. Other foods, gradually added during the year, are cereal jellies or porridges, broths, dry bread or toast, soft eggs, boiled rice or hominy, sometimes scraped beef, baked or stewed apples or prunes. And some of these should be given only at reasonable intervals—not every day.

From the third to the fifth or sixth year the diet is increased, still gradually, by the addition of vegetables, as baked or boiled potatoes, fresh peas, spinach and asparagus tops, once a day. Meats also once a day, and in small amount; the best being beef, mutton or lamb and fresh fish. Eggs and cream are very valuable, the eggs to be soft-boiled or poached; both best given with dry bread. All sorts of cereals, bread and crackers.



**Fruit** once a day; peaches, pears, oranges and berries, cooked apples and prunes. **Desserts:** These should be very plain and in small quantity; custard, gelatin, corn starch, bread or rice pudding, ice cream. Ice cream is risky unless made at home. And of milk about one quart a day.

The following articles are not safely given before the seventh year: **Meats**—Pork and game in all forms, rich gravy, ham, sausage, corned beef, salt fish, or any sort of fried meat. **Vegetables**—No fried vegetables, cabbage or tomatoes in any form, celery, radishes, beets, carrots, onions, cucumbers, lettuce or green corn. **Fruits**—No canned or preserved fruits, no fruits that are not in season, no bananas. **Breadstuffs**—No hot bread, no griddle cakes, no sweet cakes—especially with fruit in them or rich layer cakes. **Desserts**—No pastry of any sort, nuts, candy or preserves. **Drinks**—No tea, coffee or alcoholic beverages.

Now, what effect does malnutrition have on the teeth? Not infrequently we see children who, while apparently healthy, have rapid and distressing decay of their teeth, leading sometimes to evils of digestion and later exasperating disorders unless exceptional care be taken. And, on the other hand, we see others who, with apparently the best of reasons for having poor teeth, go through life without having to give their teeth any special attention. I have been very unsuccessful in finding anything that would throw any light on the subject. I hope some of you will afford me some.

There is no food, there is no substance, that exercises a direct beneficial effect on the teeth in their structure and nutrition. But that there is some direct relation between indigestion and carious teeth, either condition appearing first, is to me so evident as to need no argument or proof. I believe that perfect general nutrition makes either of them impossible.

The crowns of the deciduous teeth are already formed when the child is born. Prenatal disturbances alone can affect their development. The permanent teeth are present at birth as minute tooth-sacs. Any disturbance of general nutrition can, theoretically, affect their development. But it is very remarkable how little effect is seen in even the gravest disorders.

The chief constituents of dentine and enamel, the phosphate and carbonate of calcium, are present in much greater quantity than is used by the body in almost any diet short of actual starvation. In rickets, when the bones suffer to such a great extent, the teeth appear to suffer very little except in the delay in their appearance. And here the blame is attributed to insufficient fat.

Therefore, I quite frankly decline to theorize as to possibilities when I am so far from any probability to start with. I leave the subject to discussion, hoping to learn of the influence, if any, of the innervation, blood supply, and the constitution of the saliva; and the relation of general bodily nutrition to the teeth in particular.

## DISCUSSION

DR. W. J. SHANKLAND: To the physician or the parent, for study or pleasure, the most interesting periods of life are those of infancy and childhood. Here, too, the physiologist finds the time of greatest activity and development, while the pediatrician and vital statistician find busy fields of sickness and death.

In order to clearly understand our subject, "The General Nutrition of Children," from a dental standpoint, it might be well in the beginning to differentiate between the terms infancy and childhood. Infancy extends from birth through the first dentition or to the age of  $2\frac{1}{2}$  or 3 years, during which will occur the vast majority of the affections and afflictions detrimental to nutrition and development.

Childhood extends from infancy to puberty, or to the 15th year of life. This is a time of rapid development and great activity. Functions are now performed with more moderation and precision than in infancy and with less frequent derangement.

The numerous diseases of infancy cannot be traced to the teeth as an etiological factor. The eruption of deciduous teeth, however, may produce all the signs of inflammation and lead to suppuration, which causes an excessive salivary flow and other nervous reflex symptoms, though of such short duration that nutrition could not be affected to any marked degree thereby.

Delayed eruptions of deciduous teeth is due to the influence of heredity, disease or lack of care rather than to any tooth disorder itself. If several teeth are similarly defective at their periods of eruption an hereditary tendency may be assumed.

The essayist speaks of the relation of decayed teeth to indigestion. Caries of teeth in infancy always comes after their eruption, showing that the cause must be from some abnormality in the saliva, according to Dr. W. B. Miller of Berlin, who further states that "caries are caused either by the casual introduction of strong acids into the mouth or by weaker acids formed from fermentation of farinaceous or saccharine particles of food which decalcify the enamel, admitting bacteria to the dentine."

If indigestion has a bearing upon caries of the teeth, it is not in accordance with the statements of Dr. Miller. It is easily understood that a number of badly decayed teeth will interfere with proper mastication and cause indigestion, but it has not been demonstrated that indigestion will produce caries in deciduous teeth. When badly decayed teeth and indigestion occur simultaneously, both conditions should be corrected.

During the first year the death rate spoken of cannot be traced to the teeth as the cause. The first seven months usually pass by without tooth troubles, and this is the time of greatest mortality. According to Erass, from the statistics of sixteen large cities, 10 per cent die during the first month of life. The highest death rate is to be found in the congested city districts, where people are huddled together without regard to sanitation or hygiene.

In a recent St. Louis board of health report there was a 19 per cent death rate in congested districts in comparison with 11 per cent in the open spaces. As physicians and dentists, then, it behooves us to work for laws which would better these conditions.

Many play grounds should be maintained and a supervisor appointed to inspect the homes often and compel some attention to habits of cleanliness and the care of infants.

In regard to infant feeding, I think that the essayist has advanced some excellent ideas and thoroughly covered the grounds. By a more general observance of these rules, malnutrition would be greatly diminished. There is one point I would like to add, however, influencing nutritional disorders and development that is a condition indicating circumcision.

The majority of male infants should be circumcised.

According to Halt, rickets is apt to cause late and difficult dentition when occurring before the tenth month, after this period there is no marked change, especially in the

character of the teeth. In hereditary syphilis, however, there is a tendency to early decay.

Now passing from the consideration of infancy to that of childhood, we find the period from 3 to 6 years to be one of rest regarding tooth eruption, but one of activity in contagious diseases which may affect the oncoming permanent teeth, causing defective lines in the enamel. This is an especially important time for dental service and advice regardless of constitutional indications.

Prophylactic measures, diet, air and exercise should be strictly observed. The remaining years of childhood are marked by tooth interchange. Careful supervision should be exercised at this period in order to regulate the time and location of each incoming permanent tooth, thereby preventing irregularities or malocclusions, and preserving the interproximate spaces, which lead to cleanliness and prevent decay. At the same time the diseases of the digestive, nervous and glandular systems should be cared for by the physician. Malocclusions and irregular interproximate spaces affording lodgment for food, will lead to caries of the teeth regardless of perfect health and development of the child.

Public school children should have their teeth examined semi-annually by competent dentists and be instructed regarding the care of the teeth.

In conclusion, I will say that my study and observation on this subject lead me to believe:

*First*—That the nutritional disorders are very seldom caused by the teeth, but on the other hand nutritional disorders may leave their imprints on teeth.

*Second*—Defective teeth should receive immediate attention, whether indigestion be present or not.

*Third*—That caries will occur in otherwise healthy children, when malocclusions and irregular approximate interspaces are present.

*Fourth*—In order to lower infant mortality in congested districts, fresh air spaces should be provided, together with instruction in hygienic living.

*Fifth*—The day of prophylaxis and preventive medicine is at hand and the conditions affecting the nutrition of children should be prevented rather than treated.

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## THE MOST FREQUENT CAUSES OF MORTALITY AMONG DENTISTS, COMPARED WITH OTHER PROFESSIONS, AND PROBABLE MEANS OF PREVENTION\*

By A. O. Ross, M. S., D.D.S., Columbus, Ohio

FOR forty-six years this Association has exacted an annual president's address. Most frequently these addresses have been along some lines of advice, as to how to conduct most successfully the society and to organize more completely. However, it occurred to me that our organization was so complete and perfect that we need say but little on that subject; therefore, I have selected for the subject of this address, "The Most Frequent Cause of Mortality Among Dentists Compared With Other Professions, and Probable Means of Prevention." The reason for selecting this subject was that of drawing the attention of the dentist to his own personal danger, and knowing what these dangers are, if he be a thoughtful and careful man, he will put forth an effort to avoid them and

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\*President's address, given at the Ohio State Dental Society, 1911.



thereby prolong his life and usefulness. For this purpose I have compiled a few statistics. Under ordinary conditions I know that statistics and tables are very dry to listen to, but I thought perhaps this being of vital importance to the dentist himself, he would probably listen to a rather drawn-out statistic without growing weary. I think it would be well to state here how the following statistics were compiled. At first I thought by writing to the Bureau of Census at Washington I would be able to secure all of the statistics needed. I found, however, that the only professions classified absolutely alone are clerical, legal and medical, the dentists being classified with others under the head of professional service. This classification made it necessary for me to make an individual effort to compile statistics, which are approximately correct, from the reports of deaths that are found in our journals. Therefore I sent my attendant to the Ohio Dental Library and had her go over the dental journals by decades from 1859 to 1909, noting age at death, time in practice, and cause of death. We found reported 755 deaths; time in practice was reported in 619 cases; the diseases from which they died in 606 cases. Taking these data for a foundation we have figured out the following tables, which I think will be a great surprise to you. Owing to the close confinement and the standing partially over the patient, I had expected to find the predominance of tuberculosis and lung diseases. To my great surprise, however, I found heart disease very much in the lead. I will present the different diseases which have been tabulated in the order of their importance as shown by our investigation and compare the percentage with the clergymen, lawyers and physicians. I have also made my classification in decades. In order that I may figure the percentage of deaths by decades I have taken the number of deaths from all causes reported from 1859 to '69, '79, '89, '99, 1909; five decades. We find from 1859 to 1909 a total of 121 deaths from heart diseases, which would be 19.96 per cent. of all deaths. This divided in decades will show the first decade, 4.8 per cent.; second decade, 7.1 per cent.; third decade, 16.2 per cent.; fourth decade, 21.8 per cent., and the fifth decade, 23.2 per cent. You will notice the gradual increase from 4.8 per cent. to 23.2 per cent. I might add here that the reason the total of the percentages by decades, divided by five, does not give 19.96 per cent. is because of the percentages not being of a regular increasing ratio. The statistics from Washington show the percentage of deaths in the clerical profession to be 10.9 per cent.; law, 11.17 per cent., and medicine 7.8 per cent., leaving, as you see, the dentist largely in the lead and with an increasing ratio as shown by decades. The next diseases in importance are apoplexy and paralysis, which are classed together for the reason that the first is the cause of the latter and this is the classification found in reports from Washington on the other professions. The total number of deaths from apoplexy and paralysis is 63 of the 606 deaths reported, making a percentage of 10.3 dying from this cause. As compared with 5.9 per cent. of the clergy, 7.3 of law

TABLE OF MORTALITY AMONG THE PROFESSIONS BY DECADES:

Decades 1859 to....	69	79	89	99	09	Total	Av. %	Av. %	Av. %	Av. %
Total number of deaths from all cause.	21	42	86	220	237	606	Dent.	Clergy	Law	Phys.
Heart Diseases ....	1	3	14	48	55	121	19.96	10.9	11.17	7.8
% By Decades .....	4.8	7.1	16.2	21.8	23.2					
Apoplexy and Paralysis .....	0	3	6	28	26	63	10.3	5.9	7.3	5.6
% By Decades .....	0	7.1	7	12.7	11					
Pulmonary or Lung Diseases .....	7	9	13	18	10	57	9.4	19.4	14	12.5
% By Decades.....	33 <sup>1</sup>	21.4	15.1	8.1	4.2					
Pneumonia .....	0	1	7	11	22	41	6.7	7	6.6	8.7
% By Decades .....	0	2.3	8.1	5	9.3					
Bright's Disease....	0	3	4	15	7	29	4.8	8.4	10.1	10.4
% By Decades. ...	0	7.1	4.6	6.8	2.9					
Typhoid Fever.....	1	4	4	9	8	26	4	4.8	4.4	4.1
% By Decades.....	4.8	9.5	4.6	4.1	3.3					
Accidents.....	2	4	2	8	7	23	3.7	3.1	5.1	6.5
% By Decades.....	9.5	9.5	2.3	3.6	3					
Cancer.....	0	0	4	5	2	11	2	6.8	3.9	4.7
% By Decades.....	0	0	4.6	2.2	.9					
Suicide .....	0	0	0	4	0	4	.6	2	5.4	2.9

and 7.6 with medicine, we find this disease also on the increase. The first decade there were no deaths reported, while the ratio of deaths in the second decade was 7.1, and in the third decade 7 per cent., and in the fourth 12.7 per cent., and in the fifth 11 per cent., showing an increase from the first decade up. The next report we have is on pulmonary or lung diseases. All lung diseases are classified here excepting pneumonia. This I had expected to be the leading cause of death. To my great surprise,

I found that it was not. We have here a total of 57 deaths noted, making 9.4 per cent. died from some form of lung trouble, as compared with 19.4 per cent. of the clergy, 14 per cent. of law, and 12.5 per cent. of physician; you will note here the decreasing ratio in the rate of death from tuberculosis of the dentist. The first decade showed tuberculosis 33 1-3 per cent.; the second, 21.4 per cent.; the third, 15.1 per cent.; the fourth, 8.1 per cent., and the fifth, 4.2 per cent. You will notice here that the ratio has decreased until the dentist comes the nearer being immune to tuberculosis than members of any other profession. The next disease of importance is pneumonia. We find reported here a total of 41 deaths, making 6.7 per cent. having died from this trouble, while of clergy 7 per cent., law 6.6 per cent., and medicine 8.7 per cent. The ratio here might be said to be on the increase, as in the first decade there is no one reported, while in the second there is 2.3 per cent.; third, 8.1 per cent.; fourth, 5 per cent., and fifth, 9.3 per cent. The next disease which we will consider is Bright's disease, with the dentist low man again, fortunately. There are 29 deaths reported from this disease, which is 4.8 per cent. of all deaths, while the clergy is 8.4 per cent., law 10.1 and medicine 10.4 per cent. The ratio in Bright's disease is also on the decrease, there being no percentage in the first decade, while there is 7.1 per cent. in the second; the third, 4.6 per cent.; fourth, 6.8 per cent., and in the fifth 2.5 per cent. Typhoid fever is the next to consider, with 26 cases reported. Of the dentists 4 per cent. die of this disease: the clergy 4.8 per cent., and with medicine 4.1 per cent., showing that the dentist is just a little low in this, but a fair average. This disease runs along spasmodically to a degree, the first decade showing 4.8 per cent.: the second decade 9.5 per cent.; the third, 4.6 per cent.; the fourth 4.1 per cent., and the fifth 3.3 per cent. So that this probably shows a slight decrease in ratio. In accidents the dentist fares fairly well, there being 23 fatal accidents, which is 3 per cent. of all deaths: with the clergy, 3.1 per cent.; law, 5.1 per cent., and medicine, 6.5 per cent. This shows a decreasing ratio of accidents. The first decade was 9.5 per cent., second decade was 9.5 per cent.; third decade, 2.3 per cent.; fourth decade, 3.6 per cent., and the fifth, 3 per cent. From cancer there has only been 11 cases reported, which is a little less than 2 per cent., while with clergy, 6.8 per cent.; law, 3.9 per cent.; medicine, 4.7 per cent. This is rather low as compared with the other professions. Suicide there has only been 4 reported in 50 years, which means .6 of 1 per cent., as compared with the clergy, 2 per cent.; law, 5.4 per cent.; medicine, 2.9 per cent., showing the dentist low from that cause.

The object in dividing these statistics into decades was to learn if there was an increase or decrease in the mortality rate caused by different diseases, which is plainly shown. We will first consider heart diseases. I have classified all heart diseases under this head. This is the most prolific cause of death, being 19.96 per cent. of all causes and greatly



in excess of the other professions named. The question arises, what is the reason for this high mortality? We hesitate to try to offer a reason and only suggest probable reasons and leave you to give the answer. Years ago dentistry was practiced as a business in connection with some other vocation, not as a profession. Therefore there was not that constant nervous and muscular tension. There were few society demands. Next, when dentistry was practiced alone, there was more prosthetic and not so much operating. But as dentistry changed from business to a profession and became more exacting and the dentist was also taken up more in social affairs, will account largely for the high, nervous tension and is a probable cause for much of the heart trouble or diseases reported. Some one might ask why the surgeon doesn't have a higher rate than the dentist. The condition of the patient being operated upon would have much to do with the nervous tension. The surgeon, as a rule, does not work continuously for as long hours as the dentist, and his patient being under an anesthetic, he works as though the patient was dead, and does not have to keep on that tension for fear the slightest move might cause a fatal error. Not so with the dentist. His patient is constantly wriggling and cringing under the pain and he must be kept on a constant tension because of this wiggly patient for whom he is working, and therefore the nervous strain is so great that it is exhausting, and exhaustion of the nervous system means exhaustion of all parts of the body, and therefore, conducive to heart trouble. You know that great, sympathetic nervous system of ours cannot permit us to stand by and see a fellow being suffer without feeling a nervousness and a nervous tension and drawing of the muscles, as it were, to help him stand his misery. While we dentists are thought to be heartless wretches, yet I must say when I am working for a patient of high, nervous make-up, that I am simply exhausted after a few hours' operating and feel that I cannot proceed further without time for relaxation. You will also note that the dentist stands most of the time during the operating hours and we observe that the pulse beats are from five or six more per minute while standing than sitting. All of these combine to overwork the heart and produce the breakdown which is indicated by the statistics presented. I might call attention to the athletic heart, which is produced by too much continuous, muscular tension and exercise.

As a preventive I would suggest that the operating hours be shortened. The office work may be just as great, but if you will do your own laboratory work and less operating, I believe that the mortality from heart trouble will be less. But many stand at the chair continuously day after day and send the laboratory work out to be done, which gives no time whatever for relaxation. I think this is wrong. If we would change about and operate in the morning and do laboratory work in the afternoon, we could be kept busy just the same and probably our income would not suffer and our physique would perhaps be better. We also would suggest that some time be taken entirely away from the office and that society af-

fairs be indulged in with great care so that there would be a greater length of time for relaxation, which would no doubt decrease mortality rates. The same causes that produce this high mortality by reason of heart disease will apply to apoplexy and paralysis, which the dentist leads in by almost double the rate of the other professions. These tensions give intercranial pressure, also keep the brain constantly and unduly excited. I do not feel that I am warranted in saying more of these diseases, but will read to you the opinion of Dr. M. T. Dixon, one of our busy general practitioners of Columbus: "The fact that heart troubles are more common among dentists than in members of the medical profession, the clergy, or the law, can readily be explained. The position that the dentist must necessarily assume at his work—standing, his body partly bent, his arms extended, results in the constant contraction of nearly all the muscles of the body. To this must be added the extra exertion required when working with a nervous, restless patient. Now, constant muscular contraction means pressure on and contraction of the arteries. This, of course, means a damming back of the blood into the left side of the heart, with resulting hypertrophy. This condition is frequently associated with dilatation of the chambers of the heart, and of course with impaired valvular function of the organ and the evils which result therefrom. With a hypertrophied heart, resulting from constant muscular exertion, there is increased pressure in the arteries, and this increase in pressure will eventually be felt at the point of least resistance—in the soft tissues of the brain. Hence, as one reaches advanced life, apoplexy and its concomitant, paralysis. The reason for considerable increase in heart troubles among dentists in the last fifty years must be plain. His hours of work have not grown shorter, while the work itself has become harder and more exacting. Perhaps another important factor in the life of any professional man of today is the fact that social obligations have kept pace with the strenuousness of his work. Now, if heart troubles and kindred ailments are on the increase among dentists today, what is the remedy? Very simple, indeed; remove the cause. Shorter hours of work, more relaxation, more rest. Lead the simple life. The fact that tuberculosis is less common among dentists than among members of the other professions is readily explained. Tuberculosis is a germ disease, and dentists seldom come in contact with tubercular patients, and when they do their methods of sanitation are such that infection seldom results."

I will now consider pulmonary or lung trouble, which the dentist is very low in and, as you note, is on the decrease, in fifty years decreasing from 33.1-3 to 4.2 per cent, with an average of 9.4 per cent; while the clergy is 19.4 per cent, the lawyer 14 per cent and the physician 12.5 per cent. Modern methods and better sanitary conditions and more airy and light offices might account for the decrease in tubercular troubles. In the '50s and '60s, when many gold and silver plates were made, the old mouth blow-pipe was used a great deal. There was also more prosthetic dentistry

done in proportion in those days than in the later days, which I think would account for the tubercular conditions. The lungs were overstrained in blowing on those blow pipes. As late as thirty years ago the mouth blow-pipe was used constantly, almost independent of the foot bellows. This constant strain on the lungs would account for a great deal of tubercular trouble. We observe that members of bands and musicians, blowing the various wind instruments, are more prone to tubercular trouble than any other profession or business. And this old mouth blow-pipe certainly belongs to and is king of the wind instrument class, and was practically the cause of a great deal of tubercular trouble. Now, the nervous strain was not so great, however, which accounts for the lacking of heart trouble. And as you relieve the lung strain you have a decrease in tubercular trouble, and as you add to the nervous strain you have, as you see, an increase in the heart, apoplectic and paralytic diseases. I might suggest that the high rate of mortality from tuberculosis among physicians and ministers might be due possibly to their visiting the ailing. Many times the rooms are not properly ventilated and the physician, in his exhausted condition, might be more susceptible. And the ministers are frequently called upon to administer the last rites and are also expected to visit the sick very frequently, which might be a reason for their standing high in this respect from contagion. The dentist, as you know, is low in all of the other diseases noted of importance; in fact, so low I will not take the time for further consideration. While compiling these statistics I have observed some other interesting facts. There has been but one case of death from blood poisoning reported in fifty years. This was Dr. W. O. Culp, who died Jan. 12, 1895, at the age of 59 years, after twenty-eight years in practice. This speaks well for the carefulness of the dental profession. They evidently know how to sterilize and keep their instruments clean. This is remarkable when you consider the number of cuts that are received during practice. We also find that Dr. Blankley died of overwork at the age of 59, on March 13, 1897. Other interesting facts are the increase in the length of life, by decades, from '59-'69, the average life was 47.5 per cent; average time in practice, 18 years. The next decade, 51.7 per cent years of life, 21 years in practice. The next, 56.1 years of life, 28 practice. Next 57.9 years of life, 28 years in practice. Last decade, from 1899-1909, average age 61.8 years, time in practice 33 years. In fifty years this shows an increase in the length of life 14.3 years, and in practice an increase of fifteen years. I might add that there are many other little points that have developed since I have begun to look into this subject that I would like to take up, but time is limited and our program being long, I will bar myself the pleasure of continuing further.

## DISCUSSION

DR. RUGGLES: I wrote an article on "The Insurance of the Dentist," not written in a commercial spirit at all, but one which we are all interested in, and I found out, from many letters to the large insurance companies along this line, that the average



length of life of the dentist who enters practice at 25 years of age is about 65 years, although we can, on the other hand, see others who have practiced right up to 70 or 72 years. Only in the last month have we lost one of our members who has been operating up to 75 years, and we have now one who has passed that year and is still in practice.

One little point which occurred to me was the matter of blood poisons—the accident insurance companies that I wrote to told me that 20 per cent of all accident insurance paid dentists was due to infection from instruments. It may be seldom the cause of death, but we are frequently brought in contact with it as incapacitating us in our work. Accidents to dentists are not very frequently encountered from automobiles, and on that score you need not take out extra insurance, although there are many who use “machines” in the dental profession.

I think the doctor's subject is a very timely one and should not be passed without some discussion. We are all interested in it, and I think many of us today are suffering not only from financial trouble but from lack of recreation, due to excessive work.

DR. WHITSLAR: I appreciate the doctor's efforts in the presentation of this paper, because it gives us something we can think about, something we can utilize to our own interest in fighting off some of those diseases. It seems to me that in the prevention of pulmonary troubles we should endeavor to prevent these in our habits in the office. I suppose that many of us eat previous to going to work, take some antiseptic and wash and rinse the mouth well in order to sweeten the breath, and in doing that we automatically cut off the influence of the bacteria of tuberculosis, or pneumonia, or any other thing that may induce you toward disease. Another thing I often do, in bending over the patient and operating, is to take long breaths in order to sustain myself during the crucial period in the operation, and that also is an automatic expression of human nature to prevent disease and throw the air into the enormous walls of the lungs. I have not seen the paper, and therefore am not prepared to make any further statement.

PRESIDENT ROSS: Dr. Ruggles spoke of the insurance companies giving an expectancy of 65 years for those beginning practice at 25. According to the American Mortality Table, which includes dentists and others, those who live to 25 have an expectancy of an additional 38.8 years, making life 63.8 years. This would indicate that the dentist has an expectancy of two years more than the common lot of people. According to this table, the average life of a person who lives to 21 would be 62.2 years, as I said this was according to the American Mortality Table which I had the privilege of looking over at the State Actuary's office.

I speak unwarranted, but I have heard it stated that, taking the expectancy from birth, that it is approximately 41 years.

The reason for this low expectancy, or average life, is due to the very many ills and ailments of child life. As you are aware, the mortality rate is very great the first five years.

Regarding the decrease in tubercular trouble among the dentists, I might say that rarely do we have tubercular patients when tuberculosis is in the open form. When a man has a temperature above normal and is feeling badly from tubercular trouble, he rarely goes to a dentist to have dental work done.

Further, if he does, the dentist will most likely place cement and make the operation a short one, knowing that these fillings will remain as long as he has earthly need for the same. Therefore there is not much danger from tuberculosis. Other reasons for the decrease are noted in the paper which I will refer you to.

When I first started to compile these statistics, I thought I would not have much to do. I wrote to Washington. From there I could get very little information that was practical for me to use. I would like to give you some idea of the computing that we had to do in compiling what I have stated to you this afternoon.

Here is just one column of figures, thirty-five feet long, to add up. When I saw this I had a brain storm. And I assure you, I appreciated it very much when Mr. Fitzgerald said that I was very welcome to the use of his adding machine. And I accepted the offer very thankfully, I assure you. If this paper has caused anyone to think, and to care for his personal health, I shall feel repaid for the work of compiling and writing. I believe I have nothing more to say. Thank you.

## EXTENDED DISEASES OF THE SOCKETS AND BONES.\*

By Stewart L. McCurdy, M. D., Pittsburg, Pa.

**T**HOUGH being unable to anticipate or estimate the various positions taken by the gentlemen who have preceded me in this symposium, I must, as I understand it, take up the pathological changes involving tissues immediately around the tooth itself and the extension of these pathological changes to contiguous or remote tissues, assuming that the disease had its origin in the tooth.

The causes which may be factors in producing extension of pathological changes may be enumerated as infective and non-infective. The non-infective conditions would be such factors as arsenic left in the periapical tissues after treatment and after the filling of a root canal. The most possible error in this direction is made following the adjustment of a crown where the drilled hole, instead of following the root of the tooth, passes out through the side and into the bony tissue, the operator assuming that he is entirely within the tooth structure. Arsenic left in the tissues in such condition cannot be removed and must necessarily result in a very low grade of osseous disintegration, which will eventually destroy considerable tissue. The second variety of non-infective disease is that following cystic degeneration of the root of a tooth around the apical foramen. In this instance the little sac which is so frequently seen upon the root of a tooth develops where there is little resistance to the accumulation of serum in the bony tissues, quite infinitesimal in the beginning, being increased in microscopic quantities as occurs in all tissues which are undergoing the process of repair. In other words, the serum is from repair which, instead of making its escape as we see in surface wounds, accumulates, in some instances, to considerable size. In a recent case it was the size of an English walnut, encroaching upon the nose, antrum and the external plate, causing considerable of a tumefaction over the right side of the face. Operation showed that the root of the lateral and cuspid projected into the cavity for about one-eighth of an inch, the vessels and nerves of the apex of the teeth were entirely destroyed, the roots being roughened. In another instance, three lower incisors and the right cuspid projected into a cyst the size of the last joint of the thumb.

Contributory to these local irritants as above enumerated, we have systemic conditions, such as reduced vitality from overwork, dissipation,

\*Read before the Ohio State Dental Society.

and syphilis, as an underlying factor, and tuberculosis either in some other part of the body or in individuals who have had various forms of tubercular disease.

Infective diseases include all of those more serious destructions of bone included under the head of alveolar abscess and necrosis.

The course of extension of disease to the tissues around the teeth depends entirely upon the cause, and in those cases where there is no infection the development must be very slow, extending over a period of several years, and the tumor gradually increases in size, and in many cases it spontaneously opens or is incised by the surgeon.

In the infective varieties, the course depends entirely upon the variety of germ which is found as a causative factor. In some instances a very insignificant alveolar abscess develops quite rapidly about the root of a tooth, spontaneously opens, and a fistulous opening is left which may be without pain or marked symptoms, indeed attracting very little attention. This variety is dependent, as a rule, upon a chronic form of germ, as the *staphylococcus pyogenicus auris*. If the disease is dependent upon streptococcal infection, it runs a more rapid course, involving great area of bone in the course of a week. In one instance a little girl had a decayed first molar which was treated for what appeared to be an acute disease confined entirely to the tooth. In the course of 48 hours the infection had broken under the periosteum on the lingual side of the mandible, and when it was incised, one week later, about four ounces of pus of very offensive character and of a greenish color escaped and the inferior margin of both sides of the body of the bone was bare from the angle to the mental foramen. Such a disease is, of course, dependent upon streptococcal infection.

That alveolar abscess is the cause of many of the grave and more severe pathological changes about the oral cavity there can be no doubt. Its cause has been described by many authorities as traumatic pericementitis, absorption of the roots of permanent teeth and death of the dental pulp and the resultant apical pericementitis. Whether infection really comes from the tooth cavity or from the apical tissues, the course is about the same. The product of the decomposition forces its way through the root canal to the bone, where it becomes active, resulting in abscess formation. The pressure distends the periodontal membrane, which thus becomes the wall of the abscess. The first change is quite small, beginning in the form of an infiltrate, which later liquefies. This change involves the tissues immediately around the apex of the root, either destroying or promoting the absorption of the bone. The process of the destruction is in the direction of the least resistance from the root involved, which appears to be less on the buccal side of the alveolar abscess. In the mandible, except in cases where the lingual roots of the molar teeth are involved, when the opening of the bone is on the lingual side, the destruction continues to the surface of the bone, when external manifestations of the abscess are present, that is, a fluctuating tumor on the external surface. The process of destruction is in pro-



portion to the activity of the germ responsible for the disease. The liquid, after escaping through the compact structure of bone, goes underneath the periosteum, and, in the case before referred to, is involved in the lower half of the body of the right side of the mandible. Eventually it breaks through the periosteum into the surrounding tissues and finally through the mucous membrane into the oral cavity in maxillary disease and from the body of the mandible through the skin anywhere from the symphysis to the angle, being deflected downward by the platysma muscle and its fascia. Opening the abscess cavity either spontaneously or by incision naturally leads the inexperienced practitioner to believe that he has reached the end of the disease. If, however, the sinus persists, we have then established what is known as a chronic alveolar abscess.

A pathological condition not to be forgotten in consideration of all diseases of the bones of the face, where a fistulous opening is found which has persisted for a few months, is that a tooth must be reckoned with as the cause. If a tooth has been extracted and the wound does not heal and the fistula does not close, there is undoubtedly the root of another tooth denuded of its membrane and standing bare in the cavity.

Surgeons recognize low-grade chronic infections as a cause of serious constitutional conditions, as headache, usually intermittent in type; loss of appetite, loss of weight, and general impairment of vitality. The dentist should have in mind the fact that an alveolar abscess, even without pain and without extensive discharge, could produce the same variety of symptoms. The absorption of the smallest quantity of toxins from an infected area may produce very perceptible constitutional disturbances. It is proper here to call attention to that variety of alveolar abscess which has for its only method of exit the root of a tooth, through the pulp chamber. In such cases, considerable of a cavity may be found around the apex, with symptoms enumerated above. The amount of destruction of bone ranges from the smallest cavity, as is shown in the skull which I have before me, to the complete destruction of the mandible, a specimen of which is also shown. In the one instance, a low form of destruction extending through a period of months, destroying little bone, in the other instance, destroying a great quantity of bone before the infection can be controlled.

Attention must be called to the difference in the course of abscesses from a tooth in the mandible and one in the maxilla. Those of the maxilla run a more satisfactory course naturally, because the drainage from the diseased area is better. Where the disease is in the mandible there is no drainage from the dependent or lowest point of the cavity. Drainage must be upward, out through the gingival mucous membrane or through the skin below the body of this bone.

If the root of the tooth affected is in proximity to the maxillary sinus, this cavity will be infected, resulting in antral disease. In many of these abscesses the bony floor of the antrum is destroyed, yet the antral cavity is not entered because the membranous floor is still intact. In alveolar abscess

of the mandible, it is usual for the abscess to break through the cheek rather than into the oral cavity. It is all a question of dependent drainage.

The second serious consequence of alveolar abscess is a more grave variety of destruction of the maxillary bone, when the nasal floor, membranous and osseous, is destroyed, leaving a naso-oral fistula. In this condition we have a very troublesome complication, making it necessary for the patient to keep the opening packed constantly, requiring removal after meals, and withal leaving the mouth in a very unsanitary condition.

*Treatment:* Assuming that the dentist has made an effort to close an alveolar fistula by cutting off the root of the tooth and by draining through the tooth, and that neither of these methods has resulted in a closure, and that the process of disintegration of the bone has extended through a period of several months, the case is one for major surgical operation. The operative treatment includes the removal of the offending tooth and the removal of that part of the alveolar process external to the tooth on the side of the fistula. If other teeth have been removed on either side of the offending tooth which has been extracted, the interdental osseous structure should also be removed. Before the bone is removed, however, and after the tooth is extracted, the periosteum should be carefully dissected away from the bone up to the fistula. This is for the purpose of preserving it, so that after all of the bone up to the fistula has been removed it may be collapsed back against the posterior wall of the cavity and in this way serve as a flap so that repair may take place without further exfoliation. The later management of an alveolar abscess varies greatly with the different operators. It is my practice to convert an alveolar abscess or a suppurative condition of the bones, either acute or chronic, into a sterile field by the use of strong antiseptics, after a thorough removal of all devitalized and infected bone, after which it is closed by either suturing the gingival mucous membrane together across the cavity or making pressure upon the outside between the cheek and the bone with a considerable piece of gauze, so that the cavity may be obliterated by the collapsing of the membranous walls against the floor.

If I may be permitted to quote from a recent article upon this subject, I will describe operation for extensive disease of the mandible in the report of two cases:

*Patient*—A man, aged 50, with infection of the mandible. He had lost all of his lower teeth but three, and the cavity included practically all of the mandible on its external surface, the bone being bare throughout. The alveolar process, on its external margin, including the cavities left by the extracted teeth, stood out perfectly nude in the floor of the mouth. It had required just a month for the case to advance to the condition described.

*Operation*—This included a complete removal of the external half of the mandible from the second molar on the right side to the second bicuspid on the left, through the roots of the teeth and to external inferior margin

of the bone. This left the internal alveolar plate intact throughout with the periosteum undisturbed. The cavity was mopped out with pure tincture of iodine. The usual method of procedure would doubtless have been to pack the entire cavity, with the hope that the bone would heal by being granulated over from later approximation of the external periosteum. It was decided, however, that such an extensive cavity should be immediately obliterated. Dependent drainage was absolutely necessary if this was to be accomplished; hence an incision was made from the lowest point of the cavity in the median line through the skin under the chin large enough to admit a rubber drain the size of a lead pencil. The next step was to stitch together with catgut the labial and buccal gingival margins, thus closing off the field of operation entirely from the oral cavity.

*Postoperative History*—To my intense gratification, the two gingival margins did completely unite and not a drop of pus was ever found in the oral cavity. The drainage established from below was quite sufficient to carry off the small quantity of reparative lymph and detritus, and the patient was practically well in ten days after his operation.

This method of obliterating cavities is applicable regardless of the extent of operation whether of one or many teeth, or of the mandible or maxilla—whether of the alveolus or of half of the body. The practice of packing sterile cavities with gauze is a mistake and has not been practiced by the writer for several years.

An operation which I have done in several instances for closure of naso-oral fistula may be described as follows: Assuming that the labial gingival structures are completely destroyed and that the lingual periosteum and mucous membrane extend well down to the normal line, two incisions are made through the lateral structure, either with scissors or knife, back up to the orifice of the fistula and far enough back on the two sides to make the tongue wide enough to cover the opening. The end of the flap thus made is freshened and the corners made round. The next step is to freshen the orifice of the fistula for a distance equal to the thickness of the flap. The flap is now turned up over the orifice of the fistula and sutured there with chromicised catgut. In the three cases in which the operation has been performed the results have been perfectly satisfactory.

As must be well known to all observing surgeons, no operation is performed without there being more or less blood-clot interposed between the flaps and portions of the area included in the operation after adjustment of sutures. This blood-clot is Nature's method of filling in cavities and vacant spaces which must necessarily exist. To be sure, these cavities vary in size in different operations. They disappear and the wound entirely heals without the surgeon being cognizant of their existence in all sterile wounds. This is what surgeons choose to call blood-clot organization. The method of repair is about as follows: The blood-clot which fills in the cavity serves as a trellis work into which the leucocytes begin to pour



from the healthy blood vessels immediately after all operations and injuries. In the course of a few days the blood-clot has been entirely displaced by the scavenger leucocytes and the cells thrown out along the margin of the wound for the purpose of reconstruction and repair. The reparative cells eventually take the place of the leucocytes and become thoroughly organized, and the cavities are thus filled in with new formations.

I have been using tincture of iodine, U. S. P., as an antiseptic for the past ten years in all bone and joint operations. To my mind it is the ideal preparation. It is an alcoholic and, when applied to a tissue, does not coagulate and corrode, but infiltrates itself into the tissues and thus reaches the uttermost recess of the cavity and destroys the bacteria wherever found. It is used after operations for alveolar abscess and in antral pyemia. In joint surgery I have been using it where infective conditions existed, regardless of the location. It is poured into the central bone cavities and injected into the deep tubercular sinuses which lead into the hip and other joints. Its toxicity need not be feared since several drachms have been poured into cavities within the body and not a sufficient amount of absorption has taken place to produce one physiological symptom. It is better than carbolic acid, which is a coagulant, and peroxide of hydrogen, which, when it becomes effervescent, loses its parasitic power. The latter not only is inert when it bubbles, but the effervescence distends the cavities, carrying bacteria into deeper structures, thus increasing rather than diminishing the area of infection. Hydrogen dioxide, so frequently recommended and so commonly used by the average surgeon, to my mind has no place in the surgery of bones. It must be admitted that its power as a parasiticide is in its action upon pus or the products from pathological or granulation tissues, and that effervescence is evidence that pus is present. As a matter of fact, the moment this liquid becomes effervescent its power to destroy bacteria ends. As the gases thus produced must push out in every direction, it carries before it not a germicide but an inert bubble. Another objection to dioxide is that it should not be used in a cavity because of the effervescence, for it distends the tissue and these inert bubbles carry before them infective germs, when they are present, deeper into the tissues, thus infecting new areas. The corrosive action of dioxogen destroys healthy granulations and interferes with the process of repair.

#### CONCLUSIONS

1. Dentists should realize the seriousness of the most frequent operation they perform, namely, that of devitalizing and extracting pulps, since infection and serious bone destruction originate from this cause.

2. Destruction of the bony floor of the antrum does not necessarily mean perforation of the membranous floor or infection.

3. An alveolar fistula leading into a cavity where a considerable portion of a tooth is exposed requires extraction of the tooth before complete recovery can be expected.

4. Persistent headaches and general reduction in health are frequently caused by very insidious alveolar abscesses.

5. In destruction of the mandible, requiring removal of bone, it is advisable to establish drainage through the chin and approximate the gingival margins with sutures so as to shut off a pus cavity from the oral cavity.

6. Naso-oral fistula may be closed by a membranous flap from the roof of the mouth.

7. In all suppurative conditions of the mouth tincture of iodine, U. S. P., should be used as a disinfectant.

8. Blood-clot organization is typified in the repair of the maxillary process after the extraction of teeth. Here we may extract many teeth, leaving holes of considerable size, which are immediately filled in with blood, and even the patient never hears of it again. Why not larger cavities?

9. The practice of packing sterile cavities with gauze at every dressing is, I think, wrong, since it breaks down and destroys blood clots and valuable plastic material thrown out by Nature to rebuild damaged tissues.

10. Extensive areas of bone may be stripped of the periosteum, and, if sterilized and adjusted to the original position, will re-adhere and revitalize the bone and necrosis will not result.

#### DISCUSSION.

DR. MARSHALL: I would like to say a word. In the first place he is right when he advises us not to pack wound cavities. As long ago as thirty years I heard Dr. Atkinson say on the floor of the American Dental Association, "Gentlemen, we are all wrong in our treatment of wounds. By putting packings into them and drainage tubes we are defeating Nature in her efforts to close that wound." He said, "Throw away your text-books and use common sense, and common sense would dictate you should not put packing in those wounds; you should not put drainage in them." He says, "Get the wound clean and stitch it up and let Nature bring those parts together and heal them by first intention, which she will do if you give her half a chance." It has taken surgeons and dentists thirty years to get at that which Doctor Atkinson taught us, lo! these many years ago. I want to say another thing. What the doctor says about the tincture of iodine is also right. It is the best antiseptic solution you can use on living tissues. Mop out the pus pocket or infected wound with tincture of iodine. Surgeons today are going even farther than this; they eschew all handling of wounds or washing with water or antiseptic solution; they no longer probe these injuries nor put their fingers in them, but they paint around the wound and in the wound itself with the tincture of iodine; and it is the best germicide we have at our command, for it will destroy the germs.

I heard Dr. John Murphy deliver a lecture only two weeks ago upon the treatment of wounds. I was in Chicago at the time the American surgeons were holding their great clinics. It was the most strenuous ten days I had ever put in in my life, but I got more out of it than I ever got out of any work covering the same length of time. I learned of the new things that are being done by American surgeons, the very best of them, and I found this idea of the use of iodine as a germicide in treating wounds caused by traumatism upon the street, the accident cases, were now generally treated with tincture of iodine in preference to any other germicide or antiseptic solutions. The infection usually is on the surface except in compound fractures, in which the

bones have come in contact with the dirt of the street or have been driven into the ground; even then antiseptic solutions are not used on them; they simply saturate the wound with tincture of iodine. In other words, they try to convert that wound into as nearly a sterile wound as may be possible, and sterile wounds will heal without suppuration. I think the dentists have had much to do with demonstrating the value of tincture of iodine as a germicide. We have been using it for a great many years—ever since I have been in the profession, over forty years. I have been using it possibly in an empirical way. I was taught it would relieve an inflamed condition of the gums and mucous membrane, so followed this teaching. Its value lies in its sterilizing effect. It renders the wound or inflamed tissue sterile, and that is why such splendid results are obtained with it. What the doctor has told us about these things are right; but I don't agree with him in making drainage on the outside of the mouth under the chin when the pus can be reached with the lance through the tissues within the mouth. I have fought that method ever since I have been in the practice of my profession. I studied medicine for the purpose of knowing how to handle this sort of cases. I found after I had been in the practice of dentistry for two or three years I didn't know what I ought to know, although I had been taught a great many good things; so I took a medical course and learned what I wanted to know. I thus obtained a good foundation for my studies in oral surgery and in oral pathology. But I was taught that old error, viz., when an abscess occurred on the face from a tooth "lance it" on the outside. What do we get? Scars, ugly ones. The doctor says we can remove them by simply excising the scar and bringing the edges of the wound together with horsehair sutures and it will be gone. But I believe in avoiding them. And further, I believe in 90 cases out of every 100 you can evacuate these abscesses into the mouth and thus avoid the scar and the necessity for an operation to remove it.

DR. FLETCHER: I would like to ask you if you have seen any extended results of necrosis or had any cases of that kind, of necrosis about the teeth deposits, alveolar or peridentum, or perialveolar, whatever you have a mind to call it?

DR. McCURDY: It appears all the cases seen come from an individual tooth, as far as I can trace the history, and not from a general suppurative condition like alveolitis. But there is a tooth that has not been filled properly and infected at the time of filling, and the infection passes through to the root of the tooth and it breaks through the bone to the surface in the direction of the least resistance. Later there is found a fluctuating mass which may spontaneously open and expose the root of the tooth, which stands out in the cavity as is shown in the picture. The nutrition of the tooth is cut off and the bone is being dissolved. It may extend from one tooth to another and come to the surface a long distance from the point originally infected.



(Lantern Slide)

A bone may be stripped of its periosteum, as this picture shows, and if the area is disinfected with tincture of iodine and the membrane allowed to go back on the bone, it will readhere and revitalize the bone. Do not pack, pack, pack, as people think they must do, for it is the worst thing that ever happened.



A MEMBER: Full strength, doctor?

DR. MCCURDY: Yes, Commercial U. S. P., just as you buy it at the drug store.

A MEMBER: After you cut the abscess, what did you use?

DR. MCCURDY: Cut a hole big enough to get into the cavity and mopped it out gently with a piece of gauze. Inject tincture of iodine once a week if the cavity contains pus. This is what I want to show you. The cavity I speak of, gentlemen, is small at first, just as it was in the skull we passed around.



This does not show well. This is a little girl whom I found a month ago in the clinic. I made an incision over there, and emptied it out. I took this two weeks after the operation, and this is the point, that the girl was well at the time of the operation. The cavity was never packed, was never injected, never treated once with anything. The skin was mopped off with a piece of gauze with alcohol or iodine. It discharged freely for several days. There has been no necrotic tissue in it and no death of the bone. It is closed up. I saw her yesterday, when she happened to be at the clinic to have her teeth filled. She is entirely well. There were six or seven dental students present at the operation. I said to them, "Take an instrument and see that the bone is bare from one end to the other, then watch it and see if the periosteum does not readhere." What if I had said, "You must inject peroxide to keep it clean." It would likely have been inoculated and become an infective wound, a pus cavity. You don't do that in abdominal wounds. You let it alone, even when in a suppurative condition, so why pack and fuss and fool around? After you go over it all and sterilize it with tincture of iodine, then let it alone. I thank you, gentlemen.

DR. JACKMAN: You say there is discharging pus there (referring to slide) after your first treatment?

DR. MCCURDY: It was not pus.

DR. JACKMAN: I thought you said it was pus.

DR. MCCURDY: I said it discharged freely. If you abrade your hand you have oozing from the surface a serum; that is the serum of repair. If you have a repairing cavity or a wound any place on your body, Nature throws out a serum which encrusts it. In cavities the blood clot is first found and this is displaced by the leucocytes, and the leucocytes by repair cells. All of this time there is a serum of repair being poured out, which is nothing more than Nature's way of repairing. It is a serum and not pus. Pus is a discharge from any wound where you have bacteria destroying the leucocytes. Unless you have bacteria, you have no pus. You say, "Look at the pus coming out." It is not pus, it is just the serum coming from a raw surface. I wish people would understand not to call all the discharges coming from an abrasion pus. It is

either serum or leucocytes, or both. I have cut open a joint that has been infected and washed it out and left a tube for drainage, and around the tube a white membrane formed; that is simply leucocytes and lymph of repair. Nature rushes in with all her elements of repair to every cut or bruise, and this is simply clean material that comes out in considerable quantities, not pus at all.

A MEMBER: How deep did you have to lance to reach that abscess?

DR. MCCURDY: Not very deep; the abscess was as big as a baseball.

DR. JACKMAN: Was it brought to a point externally?

DR. MCCURDY: Yes; it would have broken out in another 48 hours; a very large abscess.

A MEMBER: Did you remove the tooth?

DR. MCCURDY: Yes, I removed it.

A MEMBER: Was there much discharge from the cavity?

DR. MCCURDY: Yes, about three or four ounces of pus.

A MEMBER: Do you know what the origin of the trouble was?

DR. MCCURDY: A decayed tooth. I know the dentist said a decayed tooth was the cause. I extracted it at the time of operation.

A MEMBER: Couldn't that have been treated through the alveolar process after the tooth was extracted? Was it too near the surface?

DR. MCCURDY: You mean this abscess?

A MEMBER: Yes.

DR. MCCURDY: The girl had a temperature of 103° to 104°, and it was swollen so that it extended up to her ear and eye, and was as big as a baseball. It had already been incised by a dentist within the mouth. As to the scar, you can repair those little dimples that are on the surface of the jaw so that they will never be seen. Dissect them out to the bone and bring the edges together with a horsehair and you will never see it again. It is a simple process. Some oral surgeon has said the reason you have better success in the maxilla than in the mandible is because of the better circulation. The reason for the better success in the maxilla is because of the deepened or better drainage. In the upper jaw you have the opening in the bottom of the wound, and in the lower jaw you must drain it into the mouth.

A MEMBER: Why is it that the surgical profession insists upon that deepened drainage, while the practice every week by the best dental surgeons are being done without external drainage and those very large abscesses are painted over with an impervious material, like solutions, and make a sheet that we can't break through, and we get the results you say.

DR. MCCURDY: That is very gratifying, I am pleased to hear it.

A MEMBER: I want to cite a case, if I may. A lady, whose face I was called upon to treat, had an abscess that was about to point. The pus was not deeper than a thin knife blade. She had been poulticing it for 48 hours with soft wet poultices. It had been treated with arsenic the same as you describe. By opening on the inside and by pressure on the outside, we got drainage almost within ten minutes on the inside and relieved the pain and the pressure, and the case in 24 hours was almost as well as yours. We saved the tooth, too, and no scar. And another case, I just punctured on the outside and got one drop of pus with the bluntest pointed lance I could use, and there was no scar. These cases are of almost weekly occurrence with us.

DR. MCCURDY: I might say that all cases of alveolar process necrosis come to me from dentists, nearly all of them, after they have had their try at them. This one particular case would have opened itself within 48 hours. This was shown to illustrate that the periosteum would grow back on the bone. The cases I get have been treated by the

dentists for weeks and months, and they get tired of them and send them to me. I do not suppose the cases you have come from that class.

DR. SMITH: There are two points in your paper upon which I want to ask questions. You say in the extraction of teeth and the redeposition of the bony tissue in the socket you have an ideal typical case of repair of bony tissue by means of blood clot. You say that is so in the extraction of teeth. If that is true in larger cases, I say, if that is true in the extraction of teeth, why not in smaller? The application is simply this: We have been discussing pyorrhea. We have been endeavoring to close up these bad pockets. The dentists do not appreciate that blood clot. The significance of it is this: If we can produce in pyorrheal pockets, after they have been sterilized, a blood clot which we can protect from infection if that blood clot is not disturbed, we have an ideal case for reparative tissue, and for the closing of a pocket. Is that not the case?

DR. MCCURDY: I think so.

A MEMBER: And another point, Dr. McCurdy, in talking with Dr. Marshall I asked him what, in his opinion, was the percentage of antrum diseases, which called for surgical treatment, that came from the teeth. I would like to get an idea of the percentage of cases that come from the tooth root infection. We do not get to see many of these cases; they are getting farther and farther away from the dentists; the laryngologist gets almost all of them.

DR. MCCURDY: I would say they are very few; probably 15 or 20%. I think the infection comes from the nose more frequently than from the teeth. I have seen quite a number of specimens where the tooth has been extracted and the whole floor of the antrum pulled off, and there was no antrum disease. A woman came to me and said, "I want you to see what is wrong with me." I placed a probe up between two teeth and found an opening into the antrum. I said, "You have a perforated antrum, but you have no disease." She had no symptoms, was perfectly well, except for an open place where I could probe. She said, "I was told I had antrum disease." I found she had never had any symptoms, but the floor had melted away. There was an opening there, simply as normal as the opening into the nose. There was no infection.

A MEMBER: I want to make a statement in regard to these cavities filling up. Do they really fill up or do we not have a collapse, and is there any new bone formed there by that clot?

DR. MCCURDY: The clot fills the cavity caused by the extraction of the tooth. If you watch these cases, study blood-clot, you will find that the clot is at first red, but in the course of a few days it becomes white. The coloring matter is taken out and the leucocytes come in and take its place. Just as the doctor suggests, the margins of the alveolar processes finally come together, as is seen in the jaws of old people.

A MEMBER: Where a patient has necrosis of the jaw, is it necessary to remove a portion of the jaw, and is it necessary to pack that inside the mouth where it is right along the buccal surface?

DR. MCCURDY: Take the girl now under treatment which I described to you a while ago. The dentist could have pulled or devitalized the tooth. When she came to me there was an opening just large enough for the probes along the second incisor. The probe showed that the bone was bare for a considerable distance. I advised an operation. I just enlarged the opening, made it about an inch long. Then I removed the body of the bone in pieces from near the anterior margin of the masseter to almost the angle on the other side. When I saw her later she said, "Doctor, my jaw falls over when I lie down." I said, "Yes, it is broken in two places." I left all the teeth in her mouth for the reason that the disease of the bone was in the body and not in the alveolar process. The fracture on the left side was farthest back. There has not been an unfavorable symptom since the operation. The cavity was mopped out with iodine from



one end to the other. The packing was not pushed into the extreme ends of the large cavity left after the removal of the bone, but just enough to keep the skin wound open for drainage.

DR. T. B. HARTZELL, Minneapolis: The hour is extremely late and I don't really care to say anything more, except just in commendation.

Dr. McCurdy has given us one of the most intelligent expositions of the subject in hand that I ever listened to. I expected him to. I have his text-book, and I knew he would accomplish that fact. I don't agree with him on one or two points, but on almost all of his points and in the use of iodine I do thoroughly agree.

I do laugh a good deal at the expression used by Dr. Marshall and Dr. McCurdy—it is the word “sterilize”—it amuses me sterilizing the human tissues. It is impossible. We tend toward asepsis. We never sterilize unless we boil or burn. Put that down where you will remember it.

Now, then, regarding the saving and rebuilding of bone. It is wonderful what the periosteum will do. I have a case where a small sarcoma was taken out, and in order to keep the ends of the mandible from coming together we banded the second molar and cuspid and put in a platinum prop and that prop has been in now a year, and I venture to say that within three months I will take that prop out because the periosteum was left and saved, and the bone rebuilt.

Now, then, he says, never pack. I thoroughly agree, if you have drainage; if you have not drainage you must pack. That serum will accumulate in the wound, and will become infected and eventually will develop pus. You must maintain drainage. We must have packing sufficient to give us drainage—and do not be afraid of opening abscesses on the face.

I am going to relate an incident: Three of my friends, one a physician and two dentists, called me in when they had made this beautiful application of flexile collodion preventing the pus from getting through. When I saw the patient it had run down the neck to the clavicle, and still they were putting on fresh collodion to check it and keep it from making a scar on the face. I said, “You had better drain this from the outside.” They said, “It will make a scar.” I said, “Make your incision where it will come under the jaw.” They said “No.” I said, “Let me do it then.” One of the gentlemen pulled out a lancet and I said, “Bring a pan.” I made an incision there an inch long and the three gentlemen left the room. The smell of pus was so offensive that I vomited before I got away. They left so suddenly they did not have an opportunity to tip Jonah. They tried to drain it through the mouth, and failed.

It is exaggerated cases of which the doctor speaks. That class of cases always should be drained from beneath. There is never a winter passes in my life that I do not pass through an experience of this kind. I always try to make the incision in line with a wrinkle. Now the other type of alveolar abscess in which you have disintegration of the bone, where the dead bone extends, never heals in the upper jaw unless you go in and take that root end off. If you fill the root and then cut it off you will get results, provided you pack the surface of the wound—save all the blood clots you can—but if you don't pack the surface of that kind of wound the mucous membrane will heal over and will close the surface of that wound. It will refill with serum, and eventually that serum will become infected by bacteria in the mouth, and you will have another abscess and another operation to perform.

Pack the surface of this abscess just deep enough to hold the mucous membrane back and keep it open until it heals from the bottom. That is the secret of surgical success.

Regarding the iodine, I want to say one word. I have spoken several times of experiments which we have had which have proven several things in the minute events in the process of inflammation. During these experiments we saw certain products of iodine had certain attractive powers. In other words, in addition to being aseptic, it

has the power of attracting leucocytes, and that is why when it is mopped in a wound it brings thousands of leucocytes into that wound that otherwise would not come, and in addition to that it does destroy bacteria. That is the scientific explanation of the value of iodine.

I was sorry to have the doctor condemn phenol. It is valuable and I use it a very great deal in the cleansing of wounds of infected material, in the destruction of bacteria, and I will tell you how I have found it valuable.

I take the pure phenol, the very pure, heavy liquid, and I mop it into the wound and leave it fifty seconds, and immediately then, if the tissue turns white, it is cooked, and within the fifty seconds I plunge in pure alcohol and neutralize it. It does have a detergent action on the growth of the bacteria, and when you put in the alcohol the alcohol neutralizes the phenol and turns the tissue pink again; and it should not be condemned although it does not have the value of iodine because it does not have the power of attracting leucocytes. If handled carelessly it is worse than useless.

## THE PSYCHOLOGICAL TESTS PERFORMED ON THE FIFTH GRADE CLASSES OF THE SIXTH DISTRICT SCHOOL, CINCINNATI, OHIO.

By Ruth Levi, M. A., Cincinnati, Ohio.

THE psychological tests performed on the two fifth grade classes of the Sixth District School during the month of October, 1911, form but the initial step in the plan of collecting, comparing and valuing statistics of the native physical and mental capabilities of those children in order to prove the efficacy, positive or negative, resulting from the treatment given by the dental inspectors.

NOTE: At various times attempts have been made to demonstrate the efficacy and efficiency of various new departures pertaining to educational matters. The Oral Hygiene Movement, following along these lines, is attempting to justify itself, not so much to the dental profession as to the laity.

Cleveland pursued a very interesting line of experiments, selecting children at random. They proved an increased efficiency, due to dental interference, of 99.8 per cent. All work of this sort should have a "control" of the same class and type of children so that results could be compared. This, however, was not the case with the above mentioned tests.

In Cincinnati two entire class rooms were selected at the beginning of this school year and all the children subjected to psychological, physical, dental and sociological tests. In addition to this the scholarship, behavior, attendance, appearance, manner, etc., were recorded. Only the children of one of these classes were then subjected to dental treatment and instruction.

Many difficulties have been encountered, some of the children or their parents even refusing to have the necessary work done. They, however, have all been interested particularly through the enthusiasm of their teachers, in the necessary brushing and general hygienic mouth procedures. Periodical dinners are given in the school for the purpose of teaching the children proper mastication and also as a reward for their endeavors. Regular tooth brush drills are held and the enthusiasm of the children is constantly maintained by showing the mouths for visitors, talks, etc.

From time to time the results obtained will be published and the work will be conducted through a second year to further prove the tests.

The paper herewith presented upon the psychological tests is an explanation to the profession of the method of procedure in this work.

SIDNEY J. RAUH, D.D.S., Cincinnati, O.

The work may be divided into three headings: First, the material used in the experiments; second, the method and handling of this material; third, the results thus far obtained; the last, naturally, being a very meager account of a table of statistics which in themselves have small value until they can be contrasted with other figures of the same nature.

1. MATERIALS. The materials for the tests may be subdivided into two parts:

(a)—The Subject.

The native capacity of each individual child, in muscular control, memory, perceptive power, ability to learn, his inherent ability to adapt himself to a new situation and to sustain adequately a new attitude towards some strange complex, forms the material to be experimented upon and tested in this undertaking. Not what he has learned at school, but what his mind *IS* personally, characteristically, the combination of native and trained capabilities, is the subject matter of the experiment.

(b)—The Objects.

Four tests—one psychophysical, three psychological—were given the subjects: the Tapping Test (psychophysical) for motor control and fatigue index, the "A." or Cancellation Test, for measuring the degree of accuracy of perception; the Rote Memory Tests, requiring a reproduction of disjoint members of a series with no logical connection, and the Substitution, or so-called "Learning" Test, which estimates the rapidity of association formed by constant repetition.

2. METHODS AND HANDLING OF MATERIALS.

To get a just perspective of the work and its results, we must always bear in mind that the stable laboratory method is not natural to the volatile human being, and that to get normal, good results the operator must first win over the child, disarm him of any fears or suspicions and make him, unknowingly of course, pliable and open to suggestion. Fortunately, young school children, and especially those in the poorer districts, as was this, are for the most part amenable and will respond under proper stimulation with the best of their powers. The first requisite, then, for the operator was to put the child in harmony with the strange environment, to make him feel "at home" and natural; the second, to make him try and try "hard"; the third, to give absolutely uniform, standardized directions for each test in as stable an environment as possible.

The Tapping and Substitution Tests were performed individually upon the ninety members of the two classes in turn, in as secluded a room as possible—in this instance, the school library.

For the Tapping Test the instruments used were a tapping board with brass plates at both ends, a brass stylus with wooden handles, which made the contacts, and a recording instrument which indicated the number of contacts. After illustrating the precise manner in which the test was to be performed, and disarming the child of any fears which might hinder his real efficiency, the operator seated him in such a way that his arm rested comfortably on the board (the right hand was always tested first).



and demanded a sample of the experiment. Usually about one-half minute was allowed for practice, but no more, for one of the objects in this, as in all the tests, was to find out how well the child understood simple directions and modified his movements accordingly.

The final instructions were:

"Hold the pencil (the stylus) at the end of the handle. Do not raise your arm, but move your hand from the wrist. When I say "*begin*" start tapping *as fast as you can* and keep it up until I tell you to stop."

The operator started the stop-watch with the subject's first tap and took the readings on the indicator at every fifteen seconds, the whole experiment lasting exactly one minute with each hand.

In the Substitution Test a piece of cardboard was shown the child, on which were nine geometrical forms, numbered respectively 1, 2, 3, 4, 5, 6, 7, 8, 9; next two sheets of paper were displayed, on the two sides of which were the same figures, lacking the numerals. The child was required to write the proper number in each figure, going by lines, having the sample before him for the first three sides, and forced to write the last from memory. The child's ability to "*learn*" with constant repetition and the amount of time consumed for this "*learning*" are the prime elements to be discovered by this test.

The explicit directions were as follows:

1. "Do you see those figures with the numbers on them? Look carefully at them, for I am going to show you exactly the same kind of figures, only they have no numbers on them.

2. Showing test papers — "What number would you put in this figure?" Here the operator had often to drill the subject, but not too long, as here also the simple directions was a part of the test.

3. "I want you to go through every line, putting the right number in the right figure. See how fast you can do it. See if you can't do it twice as fast on page 2 as on page 1, and three times as fast on page 3. Then, when we come to page 4 I am going to take this sample away from you and see if you can do it from memory."

4. "After you get through with every *line*, I shall cover it with this piece of cardboard." (This procedure obviates copying.)

The "A," or Accuracy of Perception and Rote Memory Tests, were conducted in groups of about twenty children, each group tested as an isolated whole. The operator stood at the teacher's desk, and having scattered the children through the room sufficiently to prevent the slightest danger of cooperation, proceeded to illustrate her directions.

The materials for the "A" test included only the sheet of paper with the jumbled letters upon it, pencils, and of course a stop-watch. The time allowed was two and one-half minutes, the accepted norm. A sample copy with the "a's" crossed was displayed on the blackboard for a few moments. The children awaited the signal to begin with their hands on their heads, practicing the precise movements a short while before the actual

test. Accuracy was the main demand made by this test, in terms of the number of a's crossed in the two and one-half minutes.

The directions in this test were:

1. "You each have a paper with all the letters of the alphabet mixed up on it."
2. "Turn it over when I say *now*."
3. "Go through every line and draw a pencil mark through every 'a' you see."
4. "Do not try to rub out mistakes."
5. "Do it as fast as you can."
6. "When I say 'hands on heads' stop at once and put your hands there."

For the Rote Memory Test a metranome was started at sixty seconds and a set of six oblong cards, containing 6, 7, 8 numerals respectively, was displayed on the music stand to the children. With a sample card of five numerals the operator illustrated the test, thus giving the subjects the practice need to approximate the beat of the metranome. The cards were displayed at regular intervals in graded order, the two, six numeral ones first, then the sevens and eights, time being given after each to allow the children to write them from memory. The auditory-visual-motor impulses combined in this test demand a solution in terms of simple rote memory.

The directions here were:

1. "On the back of this card are (6), (7), (8) numbers" (as the case might be).
2. "I want you to read each number out loud with me, keeping time with the clock" (the Metranome).
3. "When I say 'write,' write down the numbers."
4. "Write the number in exactly the order in which they were on the card."
5. "When you can't think of the number put a dot to show where it belongs, and to show how many numbers there should be on the card."

#### RESULTS

As these four tests were undertaken with a view to their comparative relations to the ones still to be performed later this year, they present only gross estimates as they stand here alone. The Index of Fatigue of the Tapping Test, the average of per cents of Accuracy for the Rote Memory, and the Indices of Efficiency of the Substitution and "A" tests indicate the psychophysical and mental condition of the child as he is now; each represents isolated factors to which no relation has as yet been calculated. The gross measurements are tabulated according to arbitrary rules, grouping the figures in a vivid manner, suited to the cursory examination of this paper.

In the Tapping Test, as will be remembered, the readings on the indicator were taken at every fifteen seconds. The basis of comparison in this test is the relation between the number of taps in the first fifteen seconds and those in the last fifteen seconds, a ratio which gives the Index of

Fatigue, according to which the norm of the subject is found. To illustrate: A. F. taps ninety-three times in the first fifteen seconds and ninety-two in the last fifteen seconds; to find his Index of Fatigue we would then give this formula:

$$\frac{93 \text{ minus } 92}{93} \div 1 = 0.0107, \text{ the Index of Fatigue.}$$

The results are divided into four parts: Part 1. Including all those whose taps *increased* in the fourth period, or in other words, whose Index of Fatigue will present a minus quantity—1 to 0. Part 2. Those whose taps have either *remained the same* in the fourth period or have *decreased* to an index verging toward 1. Part 3. Those whose taps have decreased in the fourth period so as to give an index between 1 and 2. Part 4. Those whose taps have so decreased in number as to give an index of 2 to 3.

#### TAPPING TEST (91 CASES)

Distribution according to Index of Fatigue.

RIGHT HAND					LEFT HAND				
Part .....	1	2	3	4	Part .....	1	2	3	4
Index .....	-1-0	0-1	1-2	2-3	Index .....	-1-0	0-1	1-2	2-3
Number of cases	1	24	42	24	Number of cases	1	20	37	31

The Rote Memory Test falls into rather evident divisions, No. 1 containing those whose memory span is less than six places; that is, those who could not remember six numbers; No. 2, those whose memory span is seven places, and No. 4, those whose memory span is eight places.

#### ROTE MEMORY TEST (85 CASES)

Distribution according to Memory Span.

Number .....	1	2	3	4
Span .....	Less than 6 places	6 places	7 places	8 places
No. of Cases .....	20	31	26	8

As a more descriptive explanation of these results, perhaps it might be well to cite two extreme examples of this test.

#### EXAMPLES

	6 places series		7 places series		8 places series	
No. 1 .....	100.	%	100.	%	100.	%
(A. F.)	100.	%	100.	%	100.	%
Average	100.	%	100.	%	100.	%
No. 2 .....	50.	%	28.6	%	12.5	%
(E. C.)	43.3	%	78.6	%	50.	%
Average	41.65	%	53.6	%	31.25	%

The "A" test is estimated here on the basis of accuracy, as the time is the same for all. The results are here arrayed to show the range of dis-



tribution of the Percentages of Accuracy with their extremes and modes and median.

### “A” TEST

#### Distribution on the basis of Percentage of Accuracy.

Percent. of Accuracy....	96.	90.	86.	84.	82.	80.	78.	76.	74.	72.	71.	69.	67.	65.	63.	61.	59.
Number of Cases.....	1	2	2	2	1	2	1	6	1	4	6	3	3	3	5	2	2
Percent. of Accuracy....	57.	55.	53.	51.	49.	47.	45.	43.	41.	39.	38.	35.	31.	29.	24.	23.	16.
Number of Cases.....	1	3	2	6	4	2	3	1	2	2	1	2	1	3	1	2	1

The grouping of cases falls under thirty-four headings, from which we compute the modes (the commonest values) and the median, or central value.

The Modes are, of course, at 76%, 71% and 51% with six cases in each.

The Median lies between 59% and 61%.

The Extremes are 96% and 16% in each of which there is one case

In reviewing the results of the Substitution Test it may be well to explain the value of the Index of Efficiency, on which the conclusions are based. The Index of Efficiency is the ratio between the time consumed and the percentage of accuracy in the test. In other words, were this index multiplied by 100, it would show the length of time in which the subject could approximate 100, or perfection, in his accuracy.

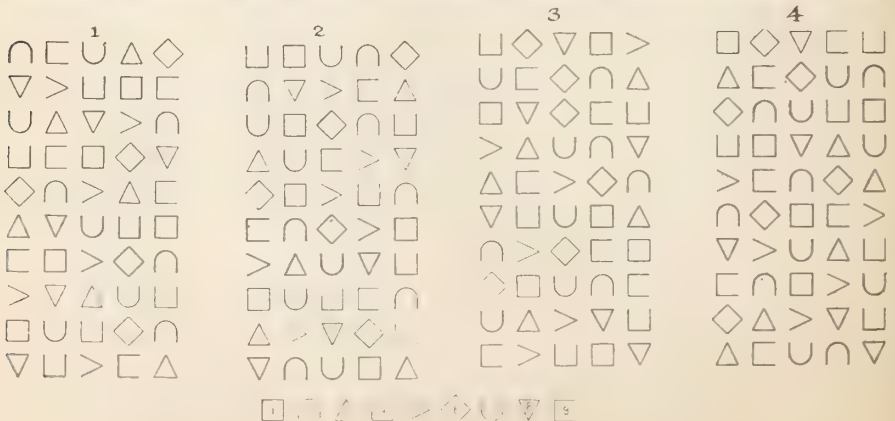
Example:—M. A. tapped 142.2" with an accuracy of 70%:

$$\frac{142.2}{70} = 2.1031, \text{ her Index of Efficiency.}$$

Now, if in 142.2" she was 70 per cent accuracy, then multiplying her resulting Index of Efficiency by 100, there will be:

2.031 x 100 = 203.1", the amount of time necessary for her to approximate perfection in this work.

It must be remembered that in this test there are four sections to be computed, alone and in relation to each other, so that the division of results must be elastic as well as arbitrary. Considering the relatively graded "learning" power of the four sections, as shown by the various Indices of Efficiency, we have divided the results into three classes—Good,



Test Papers and Key. Reduced to one fourth actual size.

xatkojhbeavupsrmtxqwkhhbcoryuaqhimzkwbmqjria  
 ldevcbtqnwlxdrzfecgrpinajhxtqkyiwmucgolkebam  
 qrgnvjshwdexcornuplhqrnzetwblhcgrtjamlfhyexr  
 bovdzdyhejilavcfonyhxjatzwgnhjfmoowbpxhtsdvpep  
 wimngsaecutjqlwhrftypdosk.

Name.....

Class.....

A section of "A" or Accuracy of Perception Test.

Medium and Poor. The Good includes all those whose accuracy is 98-100 per cent and whose speed is less than 100"; the Medium takes in all those who have an accuracy of 80-98 per cent and whose speed runs from 100"-180"; the Poor comprehends the remaining number whose accuracy is 1-80 per cent and whose speed is 180" and over. We have discriminated, however, against a few cases where the index, though high enough to be in the Medium class, belongs to the Poor, because the abnormality of the Percentage of Accuracy or of the time throughout the four pages counteracts the higher value of the other factor in the last page; and we have made an exception in the case of G. S., whose general standards may be called Poor but whose "learning" power is well defined and belongs with the Mediums; and whom we now cite as a prime example of this test.

EXAMPLE: (G. S.)

Section .....	1	2	3	4
Time .....	550.2"	356.1"	352.1"	239."
Accuracy .....	90%	98%	98%	90%
Index of Efficiency .....	6.101	3.633	3.592	2.655

SUBSTITUTION TEST (85 CASES)

Distribution according to Index of Efficiency.

Class.	1—Good	2—Medium	3—Poor
No. of cases .....	15	52	18

It is obvious that no definite conclusions should be drawn from this cursory review of the results of the tests. The rough estimates given here are arranged solely for the purpose of embodying the description of our

work in more specific terms. Our thesis was outlined with the purpose of comparing the figures we have gathered with those that will be derived from the tests of our experiments in the spring to determine the effects, if any, of the dental work upon the test class of children, as contrasted with the subjects of the other fifth grade class, whose oral defects had received no attention.

## THE MOTION PICTURE IN DENTISTRY

By Lyman L. Zarbaugh, D. D. S., Toledo, Ohio

IF THE question were asked, "How many of us, as members of the dental profession, are willing and anxious to have the public informed and educated along Oral Hygiene lines?" every man would answer "I." If, on the other hand, the question were asked, "What method should be employed to bring this to a realization in order to reach the greatest number of people in the most vivid and convincing manner?" there would be suggested nearly as many ways and means as there are men.

As we are all agreed that the public should be educated and enlightened on this most important subject, it appears that the only question is "*How shall it be accomplished?*"

While the method herein suggested is not offered as the one and only way to accomplish a purpose upon the desirability and beneficence of which our minds are in complete accord, it is maintained that this is one of the best means of spreading the gospel of Oral Hygiene among the greatest number of people in a vivid and convincing manner in the shortest possible time.

If it is too much to say that pictures are the greatest educational force in the world, certain it is that they are the most interesting form of education, and in a great many instances make the most vivid and lasting impression.

The little child first learns to know the domestic animals, the dog, the cat, etc., and the soldier man, the big black bear and other objects from pictures—not from words or names. Words are merely names of things, while pictures represent the things themselves.

The first books purchased for children are picture books, and they earnestly turn the pages for hours, absorbed with the wonders they see.

The word-skill of a Shakespeare, Emerson, Kipling or Hubbard can not, even with the help of the highly developed American imagination, bring us to the realization of anything half so vividly as a simple picture.

The stupendous growth of the motion picture industry, still rapidly on the increase, is hard to realize although all of us have noticed it in a casual way. There are in the state of Ohio alone some eleven hundred



motion picture theatres. The number in the entire United States is given by the President of the Motion Picture Exhibitors' League of Ohio as between 16,000 and 16,500, and increasing almost daily. If we think for a moment we must realize the tremendous influence that can be exerted over the wide field covered by this comparatively new force in the direction of popular education.

We have motion pictures of almost all kinds of products, showing their process of manufacture—hats, earthenware, cigars, clothing, etc. We have seen how fish and oysters are caught, how ships are launched, how food is canned, how mushrooms are grown, and how the common house-fly, with his dirty legs, is one of the greatest carriers of infectious matter, etc., all of which are interesting, instructive and educational. Then why not motion pictures of dentistry? Are any of the subjects just mentioned of greater importance than the care of the teeth? Decidedly not. The human race never will suffer from a lack of knowledge of how oysters are scooped from the slimy bottom of Chesapeake Bay, but it is suffering terribly every day from the effects of carelessness and ignorance in caring for the mouth and teeth.

The Oral Hygiene movement offers an opportunity for the dental profession to render a never-to-be-forgotten service to humanity, promoting the welfare of the human family, such as will stand out for all time, a bright spot in the history of dental science.

This is our "job;" it is our business to stay on the job and see that it is well and properly done. It would be an everlasting shame and disgrace to stand idly by and let outside parties—film manufacturers, for instance—take the initiative in this movement. And yet, when you consider the educational fields already covered by motion picture companies, it would not be in the least surprising to see them take it up if we do not. If this were done it would work irreparable harm, because, as a purely commercial project, it would not be clothed with the proper dignity or precision and would probably be more farcical than anything else. It should and must be done under the direction and auspices of the dental profession.

Plans for the making and circulation of the picture films are practically complete. No less than fifteen films will be going the rounds in fifteen different states this coming year under the direction of the Educational and Oral Hygiene Committee of the state dental society in each state.

The films will be furnished to the state societies at a nominal cost by the National Mouth Hygiene Association, or they can be had direct from the manufacturer at the same price. There is no profit in this transaction. The National Mouth Hygiene Association was not organized for profit, but for service. Full particulars as to cost, etc., can be had from Dr. W. G. Ebersole, secretary and treasurer, 800 Schofield Building, Cleveland, Ohio.

The Educational and Oral Hygiene Committee of the Ohio State Dental Society has already ordered and arranged to have the film shown in Ohio, which will take nearly four years, showing but one day, afternoon and evening, in each motion picture theater in the state. After the film has been shown in every picture theater in a town it will be expressed to the next place, and so continue until every point in the state has been visited.

The style or "story" of the pictures has not yet been definitely decided upon, but it will be something along the following lines:

First, several plain slides, with suitable explanatory text, will be shown before the running of the picture film. For instance, the text for the opening slide may be something like this: "This picture is shown for the benefit of the human race, showing how to avoid pain and unnecessary facial deformities in children. It is a free offering from the dental profession to humanity. It shows how anyone can preserve natural teeth throughout life."

Second Slide—"Shown under the direction of the Educational and Oral Hygiene Committee of the Ohio State Dental Society; film furnished by the National Mouth Hygiene Association of America."

The moving picture series will open with a home scene, showing family group, children playing or reading, mother sewing or darning, father reading the evening paper. He reads an article published by the National Mouth Hygiene Association: "The time to begin to care for teeth is in childhood," etc. Father calls mother's attention to the article, which is then shown on the screen. They then look at the children's teeth and decide then and there to instruct the children in the care of their teeth.

The next view shows a dental nurse or dentist instructing the children in the proper manner of caring for the teeth, the use of dental floss, the *folly* of blunt wood toothpicks, etc., the correct method of brushing the teeth, etc.

Then follow with a short, "cute" picture of "the baby" brushing his teeth as the dentist has directed.

Other subjects will be shown, with the text or reading matter appearing with the picture, among the most important of which will be the interior of a school room showing the examination of school children's teeth, showing that the instruments are sterilized after each child—a near view of just how it is done; also showing a near view of 20 boys and girls, showing only the mouth and teeth, and pointing out the decayed teeth in each mouth and other defects as they exist.

This part of the picture will show the number or percentage of 20 children needing dental services. It will be vivid and convincing, and should go a long way towards removing the prejudice existing in the minds of many members of school boards and teachers against it. This

part of the picture will awaken such an interest on the part of the public that they will demand the examination of school children's teeth—the very thing we are striving for; and the best way to get into the schools is to create an interest in the public mind, which will soon grow into a demand. Our part is to interest and educate the public to the need of this service. The rest will follow naturally. No human needs grow so rapidly into demands that must be supplied as those we do not know we have until our attention is called to them, especially when we learn that others are enjoying such advantages. This is the whole secret of successful advertising. Our race is one that demands equality of opportunity for every member of it and usually gets what it demands.

Then show a near view of an unhealthy mouth, loose teeth, tartar, pus, etc. Move the loose teeth with an instrument; show the ruin that neglect will cause in a mouth; then show this same mouth as it will appear a short time later, unless cared for, as barren of teeth as the mouth of a new baby.

Next show the *progress of decay* in a tooth from the very start until the death of the dental pulp, the breaking down of the enamel, etc. This will be done mechanically; the decay will be seen *moving* towards the pulp; the period or time at which the tooth begins to ache will be pointed out, etc. Some of the text, no doubt, will be along the following lines:

Fig. 1. Uncared for teeth, showing food particles, which, fermenting, form acid.

Fig. 2. Showing the acid attacking the lime in the enamel rods.

Fig. 3. Showing decay attacking dentine.

Fig. 4. Showing further progress of decay; *tooth begins to ache*.

Fig. 5. Showing undermining and breaking down of enamel walls, exposing large cavity which has been forming, *unsuspected*, for months.

Fig. 6. Showing death of dental pulp, formation of gas, pus, etc., in pulp chamber; escape of gas at apex, swelling, abscess, etc.

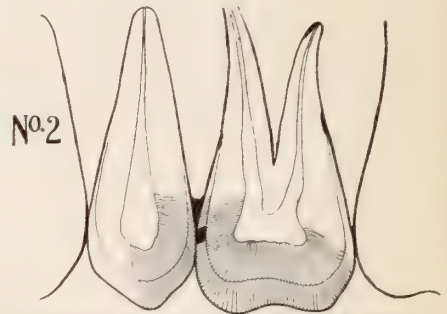
This, as well as all of the pictures, will be shown in *motion*. Just *why* the tooth aches and beats with every pulsation of the heart will be shown.

It has been suggested that inasmuch as we show the death of the pulp, for a change, and to give the people a chance to relax a little, we show the *funeral* of a dental pulp, with the owner of the tooth as chief mourner. Worked up properly it would be very funny and make the people in the theater wonder just how long they will dare to wait before they, too, will have a funeral of their own.

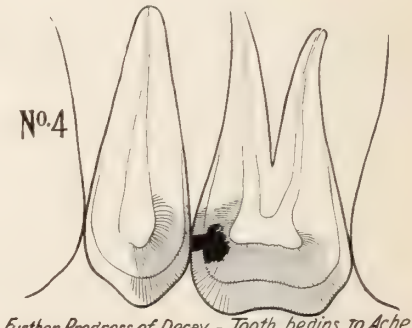
Fig. 7. A badly decayed molar, showing the growth of bacteria in such a tooth in 24 hours. The multiplication of germs also will be shown in *motion* and will teach such a lesson that anyone seeing it, who has



a decayed tooth, will not go to bed without making some effort to *clean it up*. When we consider the appalling rapidity with which bacteria multiply we can realize how interesting this picture is sure to be. According to Conn, professor of biology at Wesleyan University, "it is the power of multiplication by division that makes bacteria so significant. This power of growth is almost incredible. Some species divide every 30 minutes, or even less. At this rate each bacterium would produce, in a single



SHOWING FOOD PARTICLES, WHICH FERMENTING, FORM ACID ATTACKING THE LIME IN THE ENAMEL RODS

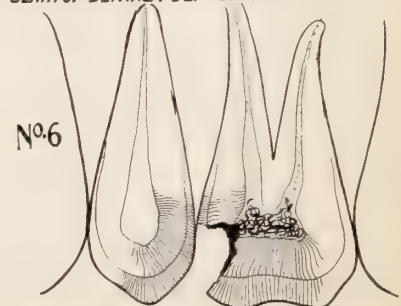
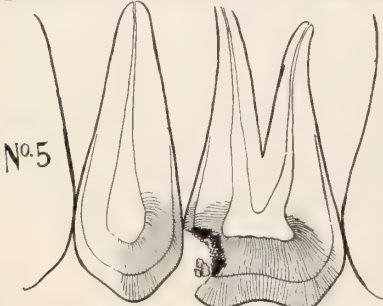


SHOWING DECAY ATTACKING DENTINE

Further Progress of Decay - Tooth begins to Ache

UNDERMINING AND BREAKING DOWN OF THE ENAMEL WALLS

DEATH OF DENTAL PULP OR NERVE

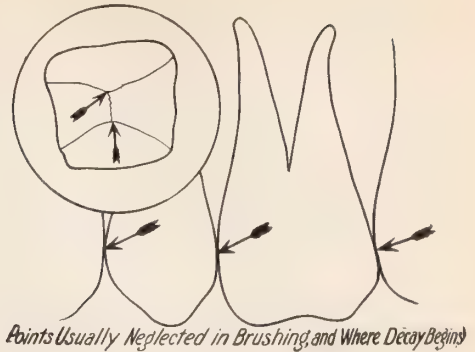


Exposing Large Cavity which has been forming, unsuspected, for Months

Formation of PUS and GAS in Pulp Chamber



Showing growth and multiplication of bacteria in such a tooth in 24 hours. Growth of bacteria is shown in motion.



Points Usually Neglected in Brushing, and Where Decay Begins

#### No. 7

day, more than 16,500,000 descendants; in two days about 281,500,000,000, or about one solid pint. At the end of the third day, unless checked, the product of one original bacterium would weigh about 16,000,000 pounds. Of course, this growth is only theoretical, as under no conceivable bodily condition could it go on unchecked."

Next, a boy who *would not clean his teeth*; show him going to bed with the toothache (make a striking example of him), show the usual fuss, hot water bottle, etc.: then show a dream that he has while in bed; he dreams of a trip to the dentist, as he *supposed* it would be. Very funny, of course, yet so arranged as not to bring criticism on the profession or detract from the real purpose of the picture. Then after the nightmare, a trip to the dentist as it *really was* show him treated kindly and relieved of his suffering, etc. State in the text for this picture that *fear* and ignorance cause more pain and keep more people from visiting the dentist than any other one thing.

Next show the good resulting from care of the teeth; show a healthy mouth from childhood to old age; show teeth without a blemish, every one sound, without even a filling. This, too, will teach a great lesson and make a lasting impression.

The motion picture is only one of the many methods to be employed by the National Mouth Hygiene Association for bringing the public to a realization and knowledge of what they can do for themselves in the way of caring for and preventing mouth and tooth trouble.

While the picture is being run in a city, newspaper articles will be printed of an educational nature, calling the attention of the public to the picture, stating when and where it can be seen, etc. Editors, without any doubt, will write favorable comments on the movement, for they are only too glad to help along any movement launched purely by humanitarian motives.

The pictures will close in some suitable manner. Suggestions will be most welcome and are earnestly requested.

Many men of the profession have signified their intention to be present to help in any way possible when the picture is being made this spring.

The National Mouth Hygiene Association needs and wants every dentist in the country who has the least regard for the uplift of his fellows and a better understanding of Oral Hygiene. Any dentist who has regard for his fellows, and who *feels* and *acts* upon his personal responsibility in the matter, will become a member of the association.

Just think what it will mean to take that school room of children, the class of 20, the bad, unhealthy mouth, the clean, healthy mouth, the tooth showing the multiplication of germs in 24 hours, etc., and show it to millions of people as clearly as if they had been there when the picture was made. It will make a lasting impression on them, and there is only one answer: They will begin to clean up their mouths; they will seek the advice and services of the men in our profession.

What would happen if that 90 per cent who *never* go to the dentist were to phone in tomorrow morning for an appointment? It's pretty certain that there would be a long waiting list.

In states where the state society does not show the film it will be shown by the National Mouth Hygiene Association; first, of course, in sections of the state where the dentists have shown enough interest in the matter to become members of the association.

Full particulars can be had from the secretary and treasurer, Dr. Ebersole. The movement is started, and every dentist that comes in for membership adds just that much more weight and influence.

The question now is: Are the men of the dental profession going to arise as one man to meet the requirements of the occasion, or are they, for the sake of a very few dollars, going to turn their faces in the other direction and pass on the other side of the street?

The answer is awaited with much interest.

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## DENTAL INSPECTION IN THE PUBLIC SCHOOLS\*

By Dr. W. C. Dunn, Meadville, Pa.

WHEN a member of your executive committee asked me to write a paper on the subject "Dental Inspection in the Public Schools," I agreed at once, as my interest in that direction has been considerable. Since that time I find our journals full of the same subject, and I hope you will forgive me if you find this article humdrum to some extent.

Dr. Greenwood of Kansas City says: "Each child, by virtue of its being a child, is entitled to the opportunity of making the most of itself. Upon no other theory of human rights can a free public school system be defended either in law or morals. If any of the avenues of the mind be

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\*Read before the Lake Erie Dental Society, 1911.



obstructed, enfeebled, or diseased so as not to perform their normal functions, the child is handicapped and it cannot do its work except at a great mechanical disadvantage." "If I were asked," says Prof. Osler, "to say whether more physical deterioration were produced by alcohol or by defective teeth, I should say defective teeth."

A clean mouth and sound teeth are absolutely essential to normal development. It is also important that the temporary teeth, with crowns intact, remain in place until the permanent teeth displace them.

The troubles that come to school children from decayed and aching teeth are almost too numerous to mention: blood poisoning due to neglected teeth; inflamed gums which prevent chewing; pus which is continually mixed with the food and swallowed; deformed faces; bad breath, due to adenoids, and all such things which would be disclosed by dental inspection.

We are at present in the midst of a crusade on oral hygiene. All our magazines are full of it, and our society programs are incomplete without it. The chief reason for its being is the condition found in the mouths of the children of our public schools. The examination of these children's mouths has made some shocking disclosures, statistics that we are alarmed at, with percentages of disease that seem impossible. The inspections of the past have largely been made under the head of medical inspection. We agree that mouth inspection is an integral part of medical inspection and that medical inspection would be incomplete without mouth inspection. But mouth inspection can be made only by men trained in that line of work, namely, dentists. As Dr. Guy Keifer of Detroit says, "Our medical inspection of school children showed that the greatest percentage of defects were to be found in the mouth. We examined three hundred without reference as to their apparent condition, simply the way they came in the schools, and two hundred and seventy needed dental attention." Dr. Sidney Rauh of Cincinnati tells us that while twenty-five per cent. could afford dental attention, in the poorer districts, less than five per cent. were cared for. As yet no great number of places employ a regular dental inspector, but a great deal of dental inspection has followed the medical inspection, some few cities, however, making a regular dental inspection. A recent journal tells us that Providence, R. I., has made dental inspection a part of its school educational system.

Perhaps the best work in this line is being done at Reading, of this state. According to the annual report (1910-1911) of the Superintendent of schools, the Reading dental society detailed twenty-five members to inspect the teeth of the pupils of the public schools. The work was promptly and exhaustively done. Eight thousand, nine hundred and twenty-five pupils were examined. Less than three per cent. had perfect teeth. Number of cavities found in permanent teeth, 28,548; cavities found in temporary teeth, 14,707; green stain, 5,910; abnormal gums, 925; tartar, 1,866; abnormal occlusion, 1554; atrophy of teeth, 308; mouth breathing,

236; putrescent pulp, 1,894; exposed pulp, 1,717. Of these conditions parents were immediately informed, with the result that thousands of children had their mouths put in order. They also established a free clinic for the poor.

The dentists of Newark, N. J., have established and maintain two dental clinics for the treatment of the teeth of the poor. If the Rochester Dental Society can raise \$3,000, it will install three dental dispensaries in the public schools this year. The equipment will be donated by the dental supply trade and cost \$1,200. Germany has more than fifty free clinics for school children. Medical inspection of school children is gaining all over the country, and this will be followed, I am sure, by dental inspection by dentists.

While serving on our local school board some two years ago, the superintendent asked the board for medical inspection for our schools, giving several good reasons for such inspection. He said a child out of health cannot study nor do his duty, and that strangely a great many defects in a child will pass unnoticed by parents, but which will tend to the lasting detriment of the child. The usual plan to notify the parents by card in case of defects was followed. Of course, as has been the case everywhere, the teeth and conditions of the mouth came into prominence. After the second annual examination, the superintendent came to me and said: "Do you know that not one-half of the children we sent cards home to last year have had their mouths attended to?" I had a talk with the medical inspector and asked him what his examination consisted of. "Why," he said, "I just report those in whose mouths I can see open cavities." "How many do you think are so affected," I asked him. Well he thought about fifty per cent., mostly in the lower grades. Now you and I know that such inspection is not one that would tell the true state of any mouth. What must the condition of these children's mouths be under dental inspection? Dr. Ebersole of Cleveland, Ohio, gives a table of school inspection in which the percentages in four schools examined run from 92.8 per cent. to 98.4 per cent. Dr. Zederbaum of Charlotte, Mich., gives in one school 98.6 per cent. defective. Our town is asking for a free dental clinic for worthy poor. The same is under consideration by the local dental society. But as yet we have no regular dental inspection in our schools. It will surely come, however. The dental inspection should be a part of every school system. The examination should be as carefully made as for a patient in the office. Also, the mouth should be put in perfect order, else the value of the examination is lost. Where people are not able to pay for such attention, it should be done by a clinic conducted by public or private charity. The great work as contemplated by Mr. Forsythe in Boston is now taking permanent form. The estimated loss to the city of Boston through lack of attention to the teeth of its school children is \$100,000 yearly. New York City has found that neglected teeth are costing the city \$800,000 a year.

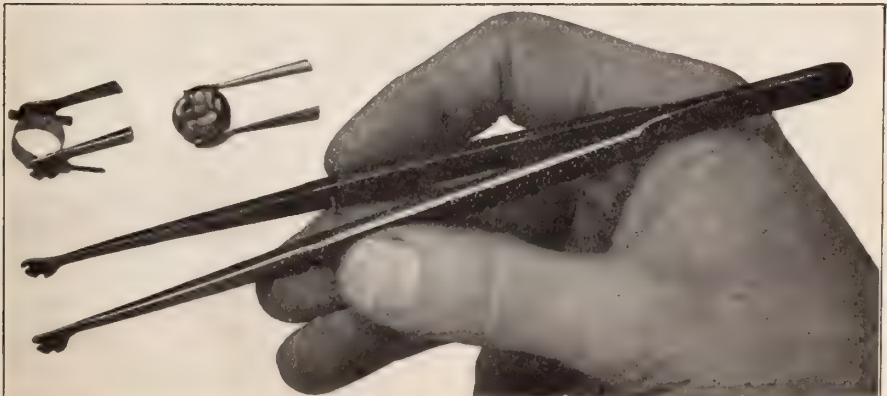
How can we expect children to do their best under such conditions? It is said that either conditions in the mouth are responsible for the physical, mental and moral backwardness of many children or that they are strangely paralleled. We all constantly deplore the loss of teeth such as the first molar, and we believe that a thorough dental inspection would make the loss of this important tooth extremely rare. Also we know that the correction of irregularities is more easily accomplished in childhood than afterward. Such correction is rarely made in the mouths of the poorer class, many never hearing of such a thing. But a proper dental inspection in our schools would enlighten them and result in a great and permanent benefit. Why have we not had dental inspection as well as medical inspection? Is it because we are so busy, or that we have not the same interest in humanity as our medical brothers? The time has come to put our shoulder to the wheel and help along the work so well begun, not only by inspection but the cure. It is up to us to urge the school boards of the districts in which we live to take up this matter of dental inspection by men trained for such work, also show them that it will be financially cheaper, even if it has to be paid for out of the public moneys. The small amount that the care of the mouths of the poor would require should be so taken care of. There is a great work before us and the health and welfare of our people demand that we do our part.

### CROWN SETTING PLIERS.

Dr. S. D. Ruggles, Portsmouth, Ohio.

The purpose of this clinic is to demonstrate a new instrument for setting crowns and regulating bands.

When a crown is to be set the mouth is usually packed with cotton rolls, bibulous paper or napkins, and when into the already obscured field you introduce the crown between two fingers, it is seldom that a clear view is at all possible.





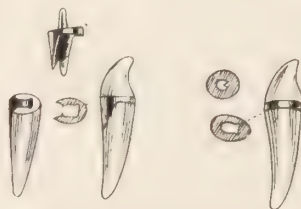
The nervous strain at this point often results in a mishap, or in placing the object in an incorrect position, resulting in failure.

The pliers illustrated have been used for two consecutive years and have proved beyond a doubt their adaptability for holding and accurately placing any crown, whether bicuspid or molar, in its proper position, and at the same time not obstructing the full view of the root. A four-tooth bridge can be handled with the same ease as a regulating band.

## REINFORCEMENT OF CROWNS.\*

By W. E. Hoffhines, D.D.S., London, Ohio.

In the calibre of a root of a lateral being reamed out for the reception of a pin weakens the walls, resulting in many cases in the splitting of the anterior third of the root. By reaming the root to receive the pin, the use of a tapered bur, making grooves at either side toward the lingual of canal, and then casting the pin and reproducing the grooves from that will utilize two-thirds of the root for the strength in biting, and in that



way it would extract the tooth before you could get any splitting of the root, the same being a reinforcement.

Furthermore, I have had several cases, finding the anterior part of the root split, by the use of a Logan crown, and by being very careful in taking the impression and possibly taking it several times, you can reproduce that split piece in wax and cast in the same manner as the other, utilizing what remains of the root for strength.

\*Given as a clinic at Ohio State Dental Society, December, 1911.

## ROOT CANAL FILLING.\*

By E. F. Crowley, D.D.S., Chicago, Ill.

In devitalization of teeth I use cocain in the ordinary way and after treatments according to conditions.

When the canals are ready to fill I use Dr. DeKrauze's root canal filler, which comes in the form of bougies of the consistency of a hard paste. The composition of this material is bismuth subnitrate, spermaceti and white vaseline, none of these ingredients being in any way injurious.

It is injected into root canals by means of a hypodermic syringe under

\*Given before the Indiana State Dental Society.

pressure of about 1,000 pounds, with a hypodermic needle or a long platinum point, or a rubber point from a White abscess syringe No. 33.

The method of applying the filler is very simple. The root canal is prepared in the ordinary way, using neither alcohol nor any essential oil, thoroughly drying the root, then packing the pulp chamber with a small piece of unvulcanized rubber. A bougie of the filler is then placed in the syringe and the air is forced out of the syringe, allowing a drop of the paste to exude to make sure of the air being forced out. The needle is then inserted through the rubber into each canal separately, holding the rubber in place with a round plugger or some other convenient instrument, after which the filler is injected into the root canal until the patient feels pressure at the apex. The rubber is then removed, and if any surplus of the filler is left in the pulp chamber, one drop of cold alcohol is used to harden it, to facilitate its removal. The floor of the pulp chamber is sealed with gutta percha or cement, and you can at once insert any kind of filling or put on a crown.

If this filler is forced through the apex of a thoroughly treated canal a better root canal filling is obtained because the surplus will not harm the tissue, as the cells of the surrounding apical space absorb the filler.

This substance is bacteriocidal and chemotaxic and will not be dissolved by alcohol or warm water of 100° F. I have also used this filler successfully in abscessed teeth and deciduous teeth.

I was not requested to read a paper on root canal fillings, but to justify my detail of explanation I want to give you my reasons for recommending this substance.

*First.* You are sure of reaching the apex of the root.

*Second.* It is bacteriocidal and chemotaxic, while the cleanest of gutta percha points are frequently found contaminated after lying around dental depots and unclean offices for unknown lengths of time.

*Third.* It is much more easily and successfully manipulated, consuming only a few minutes for the thorough filling of the most difficult of root canals.

*Fourth.* If it is forced through the apex it is absorbed by the blood, while gutta percha points will produce an irritation of the tissue and frequently cause abscess, necrosis or caries of the bone.

I have been using this filler for the past eighteen months and can report 500 successful fillings out of a possible 510.

The many advantages which I have pointed out as possessed by this root filler, in connection with the fact that I am its first user, has impelled me to give the subject rather extended consideration with the expectation that by this means I may call to the attention of our profession, so well represented here, a comparatively new discovery which, in my opinion, is of great value to us.

## METHOD OF ATTACHING A DAVIS CROWN.\*

By J. P. Becker, D.D.S., Cincinnati Ohio.

The illustration of a root with Davis crown attached, which will explain my method of attaching crown to root. I often use a platino-iridium pin in the root. The one I am sending you is all 22k gold. I grind porcelain to suit the case, and with a small pear-shaped stone I enlarge the



slot in the porcelain where the pin is secured that came with the Davis crown, but of course I do not use that pin. After my root and porcelain is prepared I press my wax in the root and at the same time press my crown up in the wax, then trim off the excess, remove the porcelain crown and insert my sprue pin in the end of the wax and remove from the root and cast. It is very simple and very satisfactory results are obtained.

\*Clinic at Ohio State Dental Society, 1911.

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## METHOD OF REPAIRING CAP AND DOWEL CROWN.

By C. W. Pratt, D.D.S., Calumet, Mich.

Having occasion recently to repair a cap and dowel crown of the Richmond type in which the dowel was broken, and being short on time, I hit upon the following expedient which worked well, and not having seen a similar method described, am sending a description of it to you.

First removed post from tooth, then taking crown drilled out as much of post as could be safely done without encroaching upon facing, using a round bur of somewhat smaller diameter than that of the round wire used for dowel. Then taking small fissure bur, squared up the hole, making it taper slightly with largest opening at base of crown. Next selecting largest size post wire possible to use, filed end to fit loosely in tapering socket in base of crown; cut to requisite length for post secured in place on crown with flux wax, and while wax was still warm placed in position in mouth, then chilled with water and removed. Next taking some of the asbestos sheeting of the sort used to wrap furnace pipes, shredded it and, moistening thoroughly with water, pressed it carefully around crown and post to a depth of one-half inch, investing in such manner that crown with facing downward stood nearly perpendicular, allowing enough open space at junction of crown and post to afford free access for flame of blow-pipe, painting exposed base of crown where impossible to pack investment with

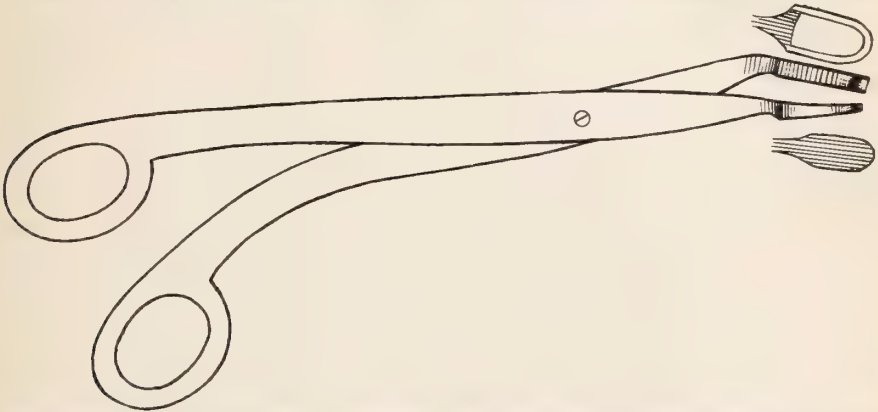


thick solution of whiting and water, heating carefully with brush flame from blow-pipe, dried out investment and soldered with 16k solder immediately. A short time sufficed to cool, and the crown was polished and set at once. The time consumed was forty-five minutes for the entire operation and the result pleasing both to the patient and myself.

### "TISSUE PUNCH."

By Dr. G. B. Speer, Los Angeles, Cal.

In your January issue you had a communication from Dr. W. H. Whitslar in regard to some instrument for removing the tissue from the third molar. I have designed an instrument for that work and am having it made for my own use. I think it will answer the requirements better



than anything to be had at present, so I enclose a sketch which you can use. I am having it made by the Frank S. Betz Co. of Chicago. I am having the "Tissue Punch" made for my own use and they, no doubt, will make the same for whoever wants them.

### SYSTEMIC CONDITIONS IN RELATION TO ORAL SYMPTOMS AND SEPSIS\*

By V. A. Latham, M.D., D.D.S., F.R.M.S., Chicago

UNTIL recently this subject had not attracted the attention of medical or even dental writers to any extent, being only now and then touched on in connection with other matters. Lacking the aid of authority I shall try to show its importance in daily practice and, at the same time, ask our members to look more attentively into their cases and see if the work of one of us is not worthy of more concentrated effort on our part earnestly to trace the subject better. I refer to the teachings and papers of the secretary of the Section, Dr. E. S. Talbot, than whom no one

\*Read in the Section on Stomatology, of the American Medical Association, of which the DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Jour. Amer. Med. Asso.*

has done more to bring together this joint work of the stomatologist and physician in systemic treatment for oral conditions.

Who have better opportunities for observing the detrimental effect of a brain-cramming system of education at the expense of the bony and muscular systems than the wide-awake stomatologists?

"Why do my children's teeth decay so young?" is a common question. "I never had a tooth filled until I was 20 years old or more," says the questioner.

Look at the child with her small, delicate frame with large head, bright eyes and a highly exalted nervous system. We are told that she is ready for high school at 13 and began day school at 4½; she does not care for sports, sits up till 9 or 10, or later, with some neighbor children, and spends three to five hours a day practicing, which excites rather than soothes the nervous system. The amusements seem to be visiting other children, fudge parties, with late suppers and later hours for retiring, and consequently too little sleep; dancing lessons on Saturday and going to the city for a matinee. It is one perpetual round of excitement, with no time for the daily care of the body, including the teeth, or assistance in the home duties, and far less desire to please others or be helpful to anyone but the child's immediate circle. The tendency of the times with the immense struggle to keep the family provided for, the extremes in dress and fashions, the daily routine excitement with seldom a moment for relaxation, cannot help but ruin the finest heritage given to a man, the vital structures by which his health, wealth, strength and happiness must be secured.

Prophylaxis—preventive medicine or hygiene—comes first and far above the mechanical art of dentistry, which is overdone. The crying demand of the nerves, however weak they are, to continue reacting by stimulation or excesses in food, drinks and automobiling, is fast developing a new set of disorders in vision, bones, muscles and heart strain, to say nothing of the nervous system. A recent recommendation of the use of the automobile (which to-day is seldom anything but a means for securing distance or speed instead of rest, tranquility and change), in lung and heart diseases as a curative agent, should be carefully considered before it is accepted. The increase in neuralgia, or so-called neurotic pains, is well known, and with the present ill-devised clothing it is no wonder that the speed and wind force should cause concussion and congestions with inflammatory conditions of the various parts of the body and especially the teeth. Again, the hurried meals at road-houses, excessive in many cases for the immediate needs, on account of the increased oxygen inhalation and faulty elimination, must cause auto-intoxication, and many patients admit this when complaining of vague neuralgic pains or backache. The present urging of very young people into business positions of responsibility is a detriment to many; their hurry to escape the uncongenial atmosphere of the study rooms, and their almost universal carelessness in attending to their daily wants become a matter for thought. Austin Flint says: "The inexorable law of the survival of the fittest applies to man, educated or

uneducated, as well as to the lower animals, and it seems useless to educate man for work which he is physically unable to perform." The present rush to finish school work allows no extra time, as a rule, for broadening out in other lines, because time and money outweigh the study.

It should be remembered that the child consumes twice as much oxygen as the adult; and throws off a corresponding amount of carbonic acid; this is a gauge of its muscular activity and thus shows the need of the growing child for pure air in plenty. All muscular exertion is an expenditure of nervous force, hence, severe mental exertion and heavy physical strain should not be undertaken at the same time. Why should children not be forced to brain activity in tender years? Because, first, the brain grows most rapidly before the seventh year; secondly, the child is called on to assimilate and appropriate enough to nourish its rapidly growing brain and body, and at the same time make good the wear and tear of its active nature. It is not expecting too much of the digestive apparatus of the child to furnish material for its bodily development and, while so doing to supply food for an adult brain? Can we expect an overworked and excited child to digest its food properly and to furnish perfect material on which to feed its starving tissues? The food question of to-day is a real one in view of the extreme notions in children in regard to what they must eat, especially their repugnance to green vegetables.

Is it any wonder that the first seven years constitute a period of stress, with the brain growth, dentition, disorders incidental to infections and other childhood diseases. The rapid and great increase in the need for orthodontia, adenoid and nasal operations, the choreic cases, disorders of vision and digestion, etc., are evidence of this. Any mental strain shows itself on the teeth by increased caries as well as increased sensibility of the dentine, and especially as a cause for gingivitis and its allies, alveolitis and pyorrhea. Overwork of any vascular part, such as the overtraining of the muscles for athletic contests, will give like results on the teeth. Mental shocks are also a serious menace to general and dental health. When brain activity is forced, a loss occurs to the system and it is called on to restore the requisite amount of phosphorus.<sup>1</sup> This

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1. A measure which has proved useful in bony suppurations and alveolitis is the internal administration of ethereal tincture of phosphorus (1 to 1,000) 3 minims after each meal, well diluted with water. If much pyorrheal infection be present, but the teeth sound, the above remedy followed by solution of mercuric chlorid (1 to 1,000) three minims between meals, is worthy of more trial. At the same time the gums should be painted with Dr. E. S. Talbot's iodine and glycerin mixture, or twice daily, anteriorly and posteriorly, with a dilution of iodine liniment (B. P.) made by adding to 2 drams of liniment water to make 4 ounces. In case of adults in whom there is much gastric flatulence and pain showing intestinal autointoxication, as well as in the infantile form of digestive disturbance, silicate of sodium acts nicely as a sedative and antiferment. Sodium silicate 172 gm., dissolved in 1 liter of water, to which a trace of fluosilicate of magnesia and carbonate of lithium has been added, may be given in doses of one to two teaspoonfuls three times daily before food, according to age and conditions present. Where the teeth are loose and very sensitive protargol in glycerole, used alone or with an electrode on an interrupted current, helps.



is a vital component of both brain and bone in nearly equal amounts; hence, we must not forget that small doses of phosphorus produce good results in the reproduction of bone and are therefore a useful adjunct in so-called pyorrheal treatment. Care must be taken in its administration lest it become a detriment instead of a help, and the co-operation with laxatives is necessary.

The condition of the oral cavity is a most important factor in surgery as an aid to antisepsis and sepsis.<sup>2</sup> The condition of the gingiva being important to the physician as well as to the dentist, dentists should study and know what is the healthy normal appearance, and its examination should be undertaken regularly and thoroughly. For convenience we may classify the diseases into two groups:

The constitutional:

1. Intestinal gingivitis.
2. Syphilis—Leukoplakia.
3. Tuberculosis.
4. Scurvy.
5. Purpura hemorrhagica.
6. Diabetes mellitus.
7. Addison's disease.
8. Stomatitis (several forms).
9. Noma.
10. Ludwig's angina.
11. Aphthae.
12. Herpes.
13. Metallic poisons (mercury, copper, lead, silver).
14. Rheumatism.

The local:

1. Traumatic inflammation.
2. Epulis, Fibroma, etc.
3. Polypi, simple hypertrophy.
4. Parulis or alveolar abscess.
5. Papillary and warty growths, chancres.
6. Vascular or nevoid growths.
7. General hypertrophy, hyperplasia.
8. Carcinoma.
9. Sarcoma.
10. Gingivitis, interstitial alveolitis, pyorrhea.

Our training should be such that we can make a diagnosis of any case we may meet with, though it requires considerable experience to do this and book knowledge is a poor substitute for the latter. Many of these diseases dentists are often called on to treat, and others, when diagnosed, perhaps should be handled by a general practitioner. If the stomatologist has been trained as it is his right to be, he can and should take care of these cases or (what is not always satisfactory) work in conjunction with the family physician. The earlier the cases are seen the better, and here the

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2. Latham, V. A.: *Dental Digest*, February, 1906, p. 127; Differential Diagnosis in Dentistry, *Dental Register*, 1895 p. 469; *Am. Med. Jour.*, July, 1905.

dentist can do good and save life and valuable time in treating such confusing symptoms as gumma, tuberculosis and neoplasms.

The debated question in the treatment of abscessed teeth—when not to extract—is one still in doubt. Why pus should be allowed to stay doing damage by its burrowing and sepsis in the mouth any more than in any other part of the body, seems a conundrum in these days of thorough surgical treatment. The danger of lymphatic infection, necrosis of soft tissue and bone is not to be lightly passed over, to say nothing of the general condition of the patient. An alveolar abscess does not always burst into the labio-dental sulcus; it is more common for those attached to the upper lateral teeth and the palatine roots of molars to burst into the palate. Abscesses on the lower teeth sometimes pierce the inner alveolar plate and burst into the *cavum oris*. From the lower teeth pus may pass inward through the bone, or between the bone and its periosteum and point under the chin or among the fasciæ of the neck, whence it may reach the thorax, and in its course cause the diseases known as *angina Ludovici* and edema of the glottis. From a molar tooth the pus may extend along the jaw into the pterygoid region, the temporo-mandibular articulation, or masseter muscle, and from these may reach the brain or ear. I have seen pus soaking backward from upper incisors, cuspids, and molar palatine roots discharging into the nasal floor, the antral cavity and cheek, forming a retropharyngeal abscess.

Ulcerative stomatitis is not a pleasant disease to deal with, especially if the patient is not of a vigorous type, and the disease is not usually found, unless by direct infection, in robust people. In adults and after exanthematous fevers in children it is more often seen, and may arise from impure milk and unhygienic surroundings. The infection almost always takes place at the necks of the teeth, causing an acute gingivitis, but, as the germs multiply and spread, it develops from a hyperemia to thrombosis of the vessels, molecular disintegration or ulceration of the gum, and, eventually, of the periosteum and alveoli. The more acute the case, the larger will be the sloughs and the deeper the necrosis. At the same time the absorption of the products of putrefaction will cause pyrexia, sapremia and even, eventually, death. The picture as presented by the gums in this condition is too well known to consider here, but it will be a wise precaution to examine such ulcerations to determine the bacterial flora<sup>2</sup> which is not only a wise precaution but a just one for the patient and stomatologist. My own experience has taught me that ulcerative gingivæ may have various bacteria of their own which, on general examination, without a microscopic smear or culture, would never have been thought of. One case I remember especially in which the smear gave a typical pure pneumococcal slide, and the patient died four days later of an acute lobar pneumonia, the whole pharynx and lung showing the membranous exudate of the same type, and inoculations of the blood in guinea-pigs showing the same characters. Another patient, who had a chicken-raising business and whom I

saw in consultation, presented a condition allied to noma, the whole of the oral cavity being one mass of membrane of a greenish-white color and the lips so swollen as to be almost indefinable. The lower lip especially, was of a blackish gangrenous color, extending to the chin. The temperature was 105 F., yet the patient tried to do her work under great difficulties until she became delirious, with sweating accompanied by violent rigors and chilliness. In this case, in which the etiologic factor was not clear, the patient may have been accidentally inoculated through a hen flying up and picking her face when feeding or being lifted off the nest, as the patient remembered several such instances; or it may have been a dental infection, as her mouth was sadly lacking in hygiene. Bacterial work then was not what it is now, or I think serum treatment would have been a great help and less tedious and difficult convalescence would have been endured. The extreme sepsis and circulatory disturbance that the patient suffered, together with the general debility and metastatic abscesses in the liver, leg and arm, rendered the prognosis very grave. Luckily, it is not a very common condition, but I have seen enough cases to make me fear the results, both from the point of view of cosmetic effects and from that of recovery. Though ulcerative stomatitis usually occurs in children, still adults are affected and it is likely to be confused with a more recently discovered disease, that is, Vincent's angina.

As in many other diseases of the oral tissues, it is thought that certain micro-organisms play a conspicuous part in the role of this disease. Froriep<sup>3</sup> first called attention to the organisms resembling yeast fungi. Gravit<sup>4</sup> found bacilli in nearly pure cultures, which were described by Loeffler<sup>5</sup> as similar to the bacillus seen in diphtheria of calves. Other investigations have confirmed the finding of this germ. In every case a bit of the exudate should be obtained with a sterile instrument and cultures taken and smears made for immediate diagnosis, which in a few minutes can easily be made, as no cumbersome laboratory stains are needed when the "soloids" can be had, and fresh solutions made from the tablets, as wanted; uniform results can be secured in a moment. If the diphtheria germ is present, a physician can be called and antitoxin administered without delay. In streptococcic infections of a high degree, with much depression, serum inoculations are a great aid in cutting short the disease; also, in some pyorrheal cases, if the infection is a pure and not mixed type. When the smear shows a spirillum type, we know we shall not succeed in cutting short the case without most vigorous therapeutic measures. The following case, which occurred last fall in my practice, may interest some stomatologists; it shows the conditions very clearly:

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3. Froriep: *Chirurgische Kupfertafeln*, 1884.

4. Gravit: *Deutsch. med. Wehnschr.*, 1888, No. 15.

5. Loeffler: *Deutsch. med. Wehnschr.*, 1889, No. 15.



**HISTORY:** The patient was a young man, aged 20 years, a student of good habits, a moderate smoker and a good athlete. He had been ailing for a month, and had been under the care of several physicians and dentists, and was treated with caustics, gargles, etc. As the young man was getting worse, showing signs of rapid loss in weight, anemia, great pain on swallowing, and could not eat, his parents became alarmed and saw a prominent surgeon and, then, a throat specialist. Finally, the patient came into my care.

**EXAMINATION:** The patient was almost prostrated from the effort of walking a block and a half from the street car, being breathless and very fatigued; he was sweating profusely; the pulse was 125, very weak and irregular; the temperature was 104 F. The breath was exceedingly offensive; the lips were swollen and it was nearly impossible to open the mouth to see the cavity and fauces. The mucous membranes were covered with a grayish-greenish deposit and bled on the slightest touch. The gingivæ from molar to molar in both lower and upper jaw were ulcerated, especially around the right and left superior centrals (pivot) teeth and laterals. The centrals had the gum ulcerated to one-third of the apex of the roots. The gum about the left lateral on the palatal position was so swollen that the patient could not shut the teeth as he bit. A deep, wide pocket came from this oozing blood and pus. The right superior molar was very much diseased and there was a large plaque of dead skin on the buccal surface. The tongue protruded trembling and was swollen, fissured, bleeding and very heavily coated. The throat, which had been sore and had been treated as if the trouble were a simple tonsillitis, on my seeing it, did not look so bad as the oral cavity. The soft palate and uvula were slightly swollen and reddened; the left tonsil had some slimy, whitish membrane. The posterior fauces were very red and had follicular spots, but no membrane. The intense pain was from the swollen tongue and lips. Deglutition was nearly impossible and gargling very difficult and painful. Pain extended along the ramus to the right ear and up the side of the face, the submaxillary glands were tender, the head ached, the eyes were suffused and slight constipation was present.

**TREATMENT:** I gave the patient a swabbing and took smears and cultures on agar and blood-serum, then carefully irrigated the mouth with a warm solution of 1 to 1,000 mercuric chlorid, later, with sterilized water; then, irrigated with alphozone solution in the strength of 1 to 50, swabbed with iodine and cleansed off the loose pieces. The patient was ordered malted milk with half cream in small quantities, and elixir digitalin compound. After a good compound cathartic pill, followed in the early morning with a laxative mineral water, the patient was kept in bed while the exhaustion was so marked, and the irrigations were kept up for 20 minutes at a time every four hours. After twenty-four hours, cupric sulphate was applied locally and washed off later; this seemed to exert a marked influence. Then liquid antiseptic washes were applied and tincture of iodine swabbed all over. Gargling and nasal douches were continued with free purgation. After three weeks the patient gained in weight and had only 99 degrees of temperature.

It was with the greatest difficulty that the disease was checked completely, for if the patient failed to attend to his swabbing and douching even for twenty-four hours, a fresh nidus would start on the superior premolar on the left side, then on the superior cuspid and on the mucous membrane of the cheek, and only constant watchfulness kept the disease in abeyance. The patient had a slight hacking cough. The lungs were good except for several small areas of broncho-pneumonia, and these yielded to bed and treatment. The extreme weakness of the patient was most marked and lasted for several months after the mouth was healed.

The diagnosis was not easy: the patient and his family all thought the disease was a direct infection from the physician who treated the throat with some application, not silver, but what they did not know. The smears

were of the greatest aid in making the diagnosis of Vincent's angina, and especially in differentiating between diphtheria and mixed infection. The ulcerative form of angina and stomatitis may be mistaken for secondary or primary syphilitic pharyngeal ulcers; it may be taken for the latter especially when it is accompanied by marked local glandular swelling. In the second set of smears from the reinfection there was a more suppurative condition. The findings in these mixed infections are never so characteristic as is usual in pure cases.

Usually the pathologic processes are so characterized clinically. This is particularly important since a great variety of bacteria are found on cultural examination of the tonsillar and pharyngeal deposit. With regard to this there is an urgent demand for a more thorough demonstration of the pathogenicity of spirilla and the fusiform bacilli. Again, the question of the occurrence of these micro-organisms in the oral cavity of healthy people is also of special interest. Miller has found them in healthy persons with carious teeth. Vincent\* saw some on the gums and pharynx in fourteen out of eighteen healthy subjects examined, and Bernheim† also noted small numbers mixed with other bacteria. In order to determine their significance positively, the determination of their degree of virulence is needed. This, however, is difficult for either the fusiform bacillus or the spirillum, since, thus far unquestionably pure cultures, either by anaerobic or aerobic methods, have been unsuccessful. Nicolat and Marotte did get a marked increase in the number of fusiform bacilli and spirilla in the condensation water of certain nutrient serum-media, but without pure culture. Bacteriologic proof of the pathogenicity of the spindle-shaped bacilli and spirilla has not, as yet, been positively given. Therefore, we must obtain more evidence by anatomic research or clinical observation. The bacilli penetrate deeply and, in new localities yield almost pure smears; hence, there is a danger of recurrent attacks.

One point to remember with regard to stomatitis is that it may follow a complication of a great number of more or less grave infectious conditions, or may occur in the course of good general health; and when one has to deal with patients in whom one may suppose a more or less abundant elimination of toxins or irritants by way of the secretions, one should always examine the mouths with care; very often more or less advanced lesions will be found. The uremic form of stomatitis is generally a serious condition; the fetor of the breath is very marked, strong and repulsive, even nauseating; the tongue is heavily coated white; when the renal symptoms are helped and the uremic intoxication clears, the inflammation of the buccal mucous membrane recovers quickly. Lancereaux, I believe, was the first to describe especially the buccal uremia and Barie first traced clearly the history of these particular symptoms. The saliva should be carefully

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\* Vincent: *Ann. de l'Inst. Pasteur*, 1899, xiii.

† Bernheim; *Ueber bacteriologischen Befund bei Stomatitis*, 1898, xxiii, 177.

tested in these cases for urea, which may be diminished or sometimes augmented. Barie had a patient who produced 900 gm. of saliva in twenty-four hours. As is well known, normal saliva always contains a certain quantity of urea, scarcely exceeding a few milligrams, or from 2 to 3 eg., exceptionally from 20 to 50 eg.; in the pathologic state, on the contrary, as in uremia 5 or 6, and even as much as 9 gm. of urea in twenty-four hours has been known; the patient produces almost as much urea in his saliva as in his urine. At present our bacteriologic investigation of the scrapings of the mucous membrane has only shown a few cocci, and what the real pathologic agent of the affection is, as well as the genesis we cannot say. Why the lower gums, particularly in the mouths of soldiers and smokers, are more prone to attacks of stomatitis, is a subject for thought.

A most valuable remedy for fetor of the breath and many forms of stomatitis which it always accompanies is oxygenated water for rinsing the mouths, on account of its tendency to kill out the anaerobic germs which seem to predominate and give the fetid odor and which have been so often noted in typhoid fever, erysipelas, auto-intoxication in the liver and intestinal cases, syphilis, eruptive fevers, infections, purpura and tuberculosis. The tongue has often been called the mirror of the stomach, and we may say that the mouth is the mirror of most of the infectious diseases and of the general intoxications of the body. This is especially true in conditions of anemia and other chronic diseases which, lately, in many countries, occurring in the practice of the physicians, have been referred to the dental specialist for a report on the existence of any septic conditions of the teeth that may be factors in the etiology, etc. I cannot do better than refer to the paper on anemia published by Dr. Walsh<sup>6</sup> in which one of the best summaries of the subject can be found. Who has not seen the anemia in children most probably due to necrosed roots and abscesses? Here is a point for discussion with the physicians and dentists as to when it is best to remove the teeth so as to avoid injury to the arch and teeth of both dentitions, and the best methods of treating such necrosed areas by the bismuth paste, etc. The work of Dr. W. Hunter has been noted in my address on oral sepsis<sup>2</sup> and pernicious anemia and its ally pyorrhea alveolaris before this Section. The various opinions on this latter subject, alone, are enough to make any reasonable man wish something could be done to bring order out of chaos. Mr. Henry Sewill<sup>7</sup> says that pyorrhea alveolaris has no connection with caries. To this I cannot agree, for caries is certainly to be found sooner or later. He says that it is a disease of middle life and old age only. I believe that most of the members here have seen it in all ages. If it is to be considered as a process of slow wasting

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6. Walsh, David: Some Points in the Modern Diagnosis and Treatment of Anemias, *Med. Press and Circular*, Sept. 24, 1902, p. 323.

7. Sewill, Henry: *Med. Press and Circular*, Oct. 22, 1902, p. 431.



of the alveoli and gradual shedding of the teeth, attended by slight inflammation and constant discharge of foul pus from within the free edge of the gum and alveolus, then we certainly can look for it in cases in which much hurried and forcible regulation has been done. I have seen many cases in which the superior lateral has been forced out from an included jaw and become the seat of a typical pyorrhea, so-called, even of alveolitis and a suppurating pocket when every other tooth was in a perfect condition, unfilled, and the mouth well cared for. Those cases of long standing may cause us to wonder whether the pyorrhea has arisen from the lowered health or whether the lowered health has arisen from the depressing effect of the local disease.<sup>8</sup>

The great increase of crowning and bridge work which show poor mechanical judgment and poor reasoning has been, I sincerely believe, one of the greatest factors in the increase of this condition from the violent gingivitis and all its sequelæ which we find almost always present except in exceptional, careful, well-fitted cases by a master hand. Again, we must note that the etiologic factor in some cases consists in articulatory disturbances in both youth and advancing age, through the displacement or advancing of the mandibular angle so that it becomes obtuse, and through the loss of elasticity of the bones by the lime deposits; and thus the appearance of pyorrhea in different parts of the arch may possibly be explained.

As this paper has already exceeded my limited space I shall only call attention to the systemic points which are associated with oral sepsis as applied to mucous membranes. Dental caries may become the exciting cause of a multiplicity of the symptoms and is itself due to two principal causes: the anatomic location of the teeth and the polypathogenic part (if I may coin the term) played by the mouth bacteria. If the Loeffler bacillus and the tubercle bacillus each engenders but a single disease and is truly specific, it is not so with the staphylococcus and streptococcus, which, according to their virulence, their mode of entrance into the body, the phagocytic power of the person attacked, their different modes of association, and, without doubt, many other conditions which we do not know, may start on the spot a circumscribed or diffuse suppuration, or may reach the lymphatics and cause an angioleukitis, an adenitis, adenophlegmon, or erysipelas and vast septic infiltrations of the cellular tissue, and may penetrate the veins as a phlebitis. Here they will determine a regional symptom of a septicemia or abscess of the gravest character. The micro-organisms, if they act on the spot, first seek the alveolus (alveolodental periostitis) then the mandible (osteoperiostitis, osteomyelitis of the jaws), or conjointly bone and mucous lining. If they follow the contiguous

8. Antral suppuration may occur from alveolar infection without the intervention of carious teeth. In cases of alveolar pyorrhea masses of granulation tissue seen on extracted teeth, on sectioning, show a rarefying osteitis spreading into the bone, while the tissue farthest away from the advancing inflammation shows fibrosis.

tissues of the mouth, we get stenoparotiditis; if they penetrate through the alveolus of an upper tooth (first or second molar) maxillary sinusitis. If they pass on to the air-passages, bronchopneumonia follows. If they enter into the digestive apparatus they produce or help to produce in people subject to chronic abscessed teeth anemia or so-called "dental cachexia" of Lejars, or the acid putrid intoxication of Richet. Everyone who has followed the clinical evolution of the lymphophlegmonous septicemia of the neck knows that it may be either simple septicemia or septic pyemia. If an incision is made in the phlegmonous parts, it is with great trouble that one will find in the deep parts a minute suppurating point containing only a dram or so of a secretion which may not be pus in character; or nothing at all may be found. Here is a clear proof that we must distrust surgical infections which do not suppurate. Suppuration may be a means of defense for the organism. In many of these severe cases death comes on very rapidly, the nerve centers being profoundly affected and not giving the brain time to react under the cellular intoxication, while the patient has a slight delirium, but depression, irregularity and weakness of the pulse, respiratory insufficiency, dyspnea, toxins thrown off by sweats, diarrhea and albuminuria.

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### IDEALS\*

By Dr. D. S. Leet, Pittsburgh, Pa.

I ASSUME that this Association has for its basic object the mutual improvement of its members mentally and materially. Our calling, being necessarily of a technical nature, has resulted in our advancement primarily along technical lines; and since our improvement in technique has for its primary object the maintenance or improvement of our material condition, it would seem that anything which might broaden us intellectually and be of material benefit to us as a profession, should be welcomed by all honest, fair-minded members of this society.

Upon this assumption I have thought it expedient to introduce a subject which I concede is unusual in dental procedure, but from the fact of its being unusual I can conceive of its being of greater benefit to the profession than the time-honored subjects we are so frequently called upon to discuss; not that it will supplant those subjects, but that it will supplement them, to the eternal good of the profession and all mankind.

In introducing this innovation I am cognizant of the fact that I may be subject to much criticism. Whatever I shall have to say will be from a heartfelt conviction of its basic truth. You, as members of this society, should concede all that is truthful and should unfalteringly reject the spurious. If, in conclusion, I shall have succeeded in presenting to your minds thoughts worthy of your consideration, I shall feel that my efforts

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\*Read before Dental Alumni Association, University of Pittsburg.

have not been in vain. I hereby humbly submit my efforts to this honorable court:

I take for my subject "Ideals," and in justification of my position quote from *Heine*: "We do not possess our ideas, but are possessed by them; they master us and force us into the arena where, like gladiators, we must fight for them."

The sum total of human experiences, the desire for personal happiness, the ambition to succeed, beget in our minds certain ideas which in a more or less definite manner impel us to their attainment. Ideas are the offspring of material conceptions.

On a cold winter day we see a poor beggar without shelter or food, clothed in rags; while on the other hand we see the rich man in his automobile, well fed, warm and smiling. The contrast begets in our own mind an idea with regard to our own material condition. From the material condition of the two we picture the idea for ourselves. Ideas are not of necessity fixed and permanent, but are influenced by contact with the ideas of others, whether spoken or written. The attainment of these ideas is profoundly influenced by our present material well-being. The better impulses of man's nature are retarded or obscured in proportion to his present necessities. Let present necessity become too insistent, he becomes a cringing slave. His economic wants—that is, food, clothing and shelter, must be assured before he can hope for the ideal.

Man is a social being; his welfare is regulated in great measure by society—that is, the whole community of which he is a part. His actions are independent only to that point where they come in contact with the actions or interests of his fellow man. Whatever tends to improve the condition of society has a direct influence upon his personal well-being, and since, as we have seen, his personal well-being is absolutely essential to the attainment of his ideals, it must of necessity follow that he interest himself in the welfare of society. He may no longer, as a dentist, confine himself solely to the restoration of defective dental organs. He is now a factor in determining how society shall be conducted for its own best interests, and self-interest, if no other, should awaken him to his responsibilities.

This is an age of progress. Paradoxical as it may seem, the man who refuses to advance is going backward. The processes of evolution are as active today as in the days of the cave man. Intellectual evolution is incomparably more rapid because of the means now employed in disseminating knowledge.

The advanced ideas of today, unpopular though they may be, are the accepted truths of tomorrow. We cannot afford to scoff at the views of minorities until we have first submitted them to the light of reason. Majorities are not necessarily right, usually not. Nearly always there is a small aggregation of thinkers, inconspicuous because of their lack of numbers, who are blazing the way to greater things—a higher order of civilization.



Magazines publish the views of men today, who, for the expression of such views a hundred years ago would have suffered martyrdom. The mighty effort of intellectual man today is toward the attainment of truth: "Ye shall know the truth, and the truth shall make you free." Religions are changing, forms of government are changing—for no other reason than that they do not represent the highest conception of intellectual man.

You and I, my friends, are forces in the great machinery of progress. The sooner we develop the power of reason and apply the result to existing conditions, that much sooner will be brought about the betterment of mankind. We are prone to look upon evolution as a process consuming immense periods of time; but as regards social evolution I assure you that the intellect of man has shortened those periods by aeons of time.

Luther Burbank has said that in six generations he can eliminate the objectionable qualities in any plant; in six generations he can eliminate the undesirable features from any animal species, and in six generations, by scientific breeding, any undesirable characteristic may be removed from a human strain. Such expressions from scientific men should serve to indicate the possibilities of evolution as directed by intelligence. It places the ideal almost within our grasp.

We stand today upon the threshold of a greater tomorrow. Intellectual man refuses to be encompassed by the walls of "good enough." His every effort is directed toward the attainment of his ever-changing ideals. He sees through the shams of the established and bends his efforts to emancipate his fellow man from the bondage of idolatry. He is forever opposed by the forces of custom and selfishness, but, armed with the sword of righteousness and the shield of truth, he valiantly assails the hosts of error. It has ever been, it ever will be, that truth shall prevail.

Every man has his ideals, consciously or otherwise. To him they embody all that is good in this world, and the next. The savage and the ignorant, the dissolute and the degenerate may be possessed by ideals that would seem abhorrent to us. The higher we progress in the scale of enlightenment the more perfect do ideals become. The ideas of the dissolute and degenerate reflect his environment. As I have attempted to show the conceptions of mankind are largely the result of his surroundings.

Two or more dentists meet upon the street and engage in conversation. To a bystander their calling is at once apparent. The practice of dentistry is narrow in its influence upon higher ideals. Any calling that requires constant application of mental and physical energy to its successful attainment must be narrowing upon higher intellectual conceptions.

Walter Bagehot, in "Physics and Politics," says that in prehistoric times the struggle for existence was so fierce that no one had time to think—thinking required leisure. Advancement comes from thinking.

Someone having carefully examined into the social condition of the men whose names are remembered in the Biographic Dictionary of England, says: "Very few came from the idle upper class, still fewer came

from the overworked millions of the lower class; the men who have made England great came from those families which had steady and agreeable employment, but not of such nature that they had no leisure." Again the old saw applies, "All work and no play makes Jack a dull boy; all play and no work makes him a mere toy."

It has long been apparent to thinking men that society is in a condition of disorder. We have our periods of business depression, in which all classes suffer. Financial wrecks are strewn in the wake of our panics. Sickness, privation and death stalk in the ranks of those dependent upon their daily toil. The disparity in the distribution of wealth annually grows greater; we have the multi-millionaire on one hand, and the million paupers on the other.

The laborer, because of his material condition, is restless. He feels that society is out of joint. His strikes are a protest against the injustice he feels but has not the leisure to study and understand. Statistical evidence points to the fact that less than 1 per cent of our population own over 50 per cent of our wealth, and the gap is constantly becoming wider. He is constantly reminded by demagogues of his liberty.

In behalf of the laborer I cannot refrain from quoting from Thomas Carlyle: "Liberty, I am told, is a divine thing. Liberty when it becomes the liberty to die by starvation is not so divine. That I have been called by all the newspapers a 'free man' will avail me little if my pilgrimage have ended in death and wreck. Liberty requires new definitions."

Wealth, roughly speaking, is the result of labor applied to natural resources, and is of value because it may be exchanged for those things desired by mankind. Labor should stand higher in the scale than wealth, because without labor wealth never would have existed. The laborer, comprising probably 90 per cent of our population, has been and is producing this wealth. He owns probably less than 50 per cent of it. It is evident that he has not received his just proportion.

We have within our midst today a considerable body of men and women who profess to see the cause of this concentration of wealth in the hands of a few. They further profess to see the cause of panics and the consequent degradation of labor. Having discovered the cause, and the effect being apparent to all who may choose to investigate, what more natural than that they should cast about for a solution of these ever present evils? This they have done in such a manner that today there are probably 40,000,000 enthusiastic advocates of that propaganda in the civilized world, and their numbers are increasing by leaps and bounds. No movement since the dawn of civilization is to be compared with it, save only the spread of Christianity. The movement had its origin in Europe and its greatest strength at present is in foreign countries, but its advocates in this country are increasing at a wonderful rate and expect to double in numbers by the next presidential election. That the movement has not

been accorded more popular support is because of the difficulty encountered in placing it before the general public in its true light. The press, being under the domination of the wealth-owning class, very clearly could not be counted upon to antagonize the interests of the wealthy. The movement, then, being a working class movement, must rely upon the working class to disseminate knowledge upon this vital subject. This is being done as thoroughly as lack of funds will permit.

The soap-box orator talks to his fellow workers at the street corner, if permitted. The views of the movements, leading thinkers, are circulated in pamphlet form. A few small papers and periodicals are to be had. This city has several small halls where the workers are invited to assemble and hear the best thought of advocates of the movement. On all occasions you are requested to offer any objections you may seem to have. The subject is discussed with the sole view of enlightening all parties. Should anyone desire to debate the question he will be gladly accommodated. In short, they have nothing to conceal and are eager to match their logic with the best afforded by advocates of the existing order. A brief synopsis of that for which they contend might not be amiss, and would, perhaps, suggest thoughts worthy of your consideration. The basic principles cannot of necessity cover all phases of this subject, but all phases of the subject will, upon careful examination, be found to rest securely upon those basic principles.

Socialism, for you will already have named my subject, is the key to an ideal condition of society as conceived by its advocates. It is both evolutionary and revolutionary in its conception. *Evolutionary* in that it is the result of certain economic forces, active since the creation of man. *Revolutionary* in that it seeks to destroy a system that does not meet the highest conception of its advocates; in this it is progressively constructive.

The socialist contends for collectivism, equality and democracy as the trinity which shall emancipate all mankind from economic bondage. By collectivism he means that all things that are of collective concern shall be collectively owned and operated. That society as a whole shall enjoy the product of society's efforts in proportion as each contributes by his efforts. That the benefit of labor-saving inventions shall accrue to all equally instead of as now, a few controlling these great blessings that they may extract profits from the many.

By equality he means that each shall have an equal opportunity to indulge in the bounties of nature. That the introduction of labor-saving methods shall lessen the burden of human labor to all alike; that the multimillionaire and the pauper shall no longer exist as such; that the trained intelligence of one shall no longer act to enslave the untrained intelligence of others. By democracy he means the actual equal participation of all alike in all matters of collective concern.

(To be Continued.)



## A UNIVERSAL METHOD OF ORTHODONTIA BY MEANS OF REMOVABLE APPLIANCES.\*

By O. W. Briner, D. D. S., New York, N. Y.

*(Continued from page 185, March Dental Summary)*

### BILATERAL DISTO-LINGUAL OCCLUSION OF THE LOWER JAW — JUMPING THE BITE

To correct this form of malocclusion we must perform the difficult operation of "jumping the bite." This is accomplished by the intermaxillary reciprocal action of steel springs in the following manner. To the posterior buccal wire framework of the upper appliance is soldered on each side a small piece of tubing. To the anterior labial part of the lower wire framework on each side is soldered a similar piece of tubing. A straight steel spiral spring of suitable length, depending on the case and amount of intermaxillary movement, is now supplied at both ends with a piece of German silver wire which fits like a plug into the tubing on the sides of the appliance. The plugs are joined to the springs by soft solder and then quickly immersed in cold water to preserve the temper of the steel. One plug end of this steel spring is now inserted in the upper tube and the other plug end is inserted in the lower tube on the same side of the jaws. The wire plug enters the upper tube through the anterior opening and enters the lower tube through the posterior opening. In the same manner a spring is adapted to the appliances on the opposite side. The tendency of these springs to straighten themselves out supplies the necessary force for bringing the arches into normal relation. It is preferable to use square tubing for the upper appliance and round tubing for the lower, or vice versa. The square tubing thus prevents the entire spring from rotating, and the round tubing prevents any distortion due to twisting caused by the lateral movement of the lower jaw. By making a vertical joint in each wire plug as it emerges from the tubing, allowing the plugs and spring to bend at about right angles, the tension on the spring is made more uniform. With the proper adjustment of the various parts of this device, quite a free range of movement is given to the lower jaw without any tendency of forcing the teeth into supra occlusion. The distance antero-posteriorly between the upper and lower tubes may be increased by soldering the upper tube to a horizontal wire extension, which in turn is soldered to the wire framework underneath the buccal vulcanite. This preserves the efficiency of the springs at the heels of the appliance and also gives the steel springs a better opportunity for exerting their force. The wire extension may be so bent as to bring the tube higher up in the vestibule.

Another modification of this method may be made by joining the two springs into one piece by soldering their anterior ends to a small piece of

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round wire. With the two end plugs of this double spring in position in the upper tubes, the anterior round wire piece in the middle is lifted over two narrow "U" shaped vertical loops made for its reception at each end of the lower labial wires. This wire is supplied with shoulders to prevent it from sliding through the loops.

#### OVERCOMING RESISTANCE CAUSED BY INTERLOCKING OF THE CUSPS

The interlocking of the cusps, which greatly retards tooth movement, especially in cases similar to the one just described, may be entirely overcome by extending arms of the vulcanite into the inter-proximal spaces and then on to the occlusal surfaces of the teeth, making the entire occlusal surface a plane of vulcanite. This is best accomplished by an extension from the lingual vulcanite. However, in case both the lingual and buccal sides are employed to supply the occlusal surface, the rubber is first vulcanized in one piece over the occlusal surfaces and embrasures and then separated along the middle of the occlusal surface by a thin saw to permit the action of the springs at the heels of the appliance.

#### FACIAL ANCHORAGE

These appliances can be very handily attached to the Facial Anchorage Device suggested by Dr. Barnes of Cleveland, O., in cases where anterior movement of the arches is indicated to prevent impaction. This contrivance resembles somewhat the rim of a baseball mask, with an external labial wire bow extended horizontally in front of the lips. Toward this bow the appliances are forcibly drawn. The rim is held in place by stout elastic rubbers embracing the cranium. The writer suggests that only the upper half of the rim be employed and that only the upper appliance be attached thereto, thus permitting free action of the mandible, which instead can be brought forward by the intermaxillary springs described in the preceding chapter. This arrangement is more comfortable for the patient and has the additional advantage of reducing any tendency of the teeth to be pulled into supra-occlusion. To bring both arches forward the force exerted between the upper arch and facial anchorage device must be greater than the intermaxillary force exerted horizontally by the springs, and the ratio of the pressures should be regulated according to the requirements of the case. Thus by a proper adjustment of the forces, while the lower arch is being brought forward the upper arch could be kept stationary, moved posteriorly if necessary, or brought forward to any desirable extent.

#### EFFICIENCY OF WIRES AND SPRINGS AT THE HEELS. WIRE SWAGING

Where the heel springs are not jointed, precaution should be taken to preserve the efficiency of the springs at this part of the appliance by transferring as much of the strain as possible to the labial and lingual

sides of the appliance. This is accomplished by avoiding the use of the buccal vulcanite when such a course is found expedient, by embracing only a small portion of the arch with vulcanite in this region when it is used, by allowing the lingual arm of the heel spring to emerge from the center of the lingual vulcanite, by soldering all attachments as far mesially as is consistent with efficiency, and lastly by using labial and lingual wires which taper to a much smaller gauge as they approach the median line. This wire also increases the efficiency of the labial and lingual wires and is made by an apparatus on the market known as a wire swager. The efficiency of the palatal wires as springs may also be increased by a more uniform distribution of the force throughout the entire wires by this principle. The gauge of the labial and lingual wires may also be reduced in successive uniform stretches resembling the form of an open telescope.

#### GRADUAL MOVEMENT OF WIRES AND TEETH

During the entire course of treatment it is essential that we move the teeth gradually and not cause too severe a pressure on the arch by excessive bending of the wires. It is, therefore, advisable to ascertain the exact amount of expansion or contraction to which the appliance has been subjected before returning it to its position in the patient's mouth. With that end in view, very fine holes are drilled at these points of the appliance through which we wish to keep track of this expansion or contraction. Then by means of a suitable compass, the original relative positions of these points are transposed from the appliance to a slip of paper. At each visit of the patient a new record slip is made showing the new relative positions of these points. Each slip can be compared with the preceding one by holding them one over the other before a penetrating light, or they can be compared by means of the compass. By so recording these points as to give the amount of expansion or contraction caused by bending the palatal wires, the amount caused by bending each of the other wires, and the amount caused by the combined bending of the wires, the exact cause of any excessive bending can be readily determined and remedied. These slips stamped with the date, together with the plaster models made from time to time, give us a most complete record of our case. A quick method of recording the amount of expansion or contraction is to mark off the measurements with a compass on several lines, each line representing the distance through some particular portion of the arch.

#### INTERCHANGEABLE APPLIANCES

The writer wishes to call attention to one of the unique possibilities of this method of Orthodontia, i. e., the possibility of treating a traveling patient or one residing a great distance from the dental office, by means of interchangeable appliances sent back and forth through the mail. Two appliances are made from the same model with such extreme care that after measuring and remeasuring them we are assured of their similarity in size



to the smallest fraction of an inch. Before allowing the patient to depart with one of the appliances in position, the orthodontist makes a perfect record of its size and shape by recording its shadow on a piece of highly sensitive photographic printing paper. The second appliance is then bent one stage in advance of this shadow record and a similar record made of the readjusted appliance, which is then sent to the patient, the patient in turn sending the first appliance to the orthodontist, who in turn adjusts this appliance to one stage in advance of the last shadow record, etc., etc. The patient can be instructed how to take a mush bite in a substantial modeling compound and send same along from time to time for inspection by the orthodontist.

By a combination and modification of the foregoing principles, a device can be made for correcting every case of malocclusion amenable to orthodontic treatment. We will now discuss, very briefly, the five considerations mentioned at the beginning of this article.

1st—*The Least Painful.* This method conforms with all the requirements essential to the painless movement of the teeth. The following advantages, however, eradicate some of the possible sources of pain. Being removable, the appliances can be adjusted outside of the mouth, and the amount of expansion or contraction of the wires can be accurately determined before their return to the patient's mouth. When inserted the force is immediately distributed throughout the entire arch. The non-use of wire ligatures, nuts, threads, and the limited use of bands obviates the possibility of painful irritations from these contrivances.

2nd—*The Most Efficient.* Every tooth available is utilized to perform its share in the anchorage, and the force being thus distributed as evenly as possible throughout the entire arch, the desired result can be attained in the least possible time consistent with tooth movement. The appliances, being situated mostly on the lingual side of the arch, bone-growing is enhanced by the movement of the tongue against them (especially the palatal wires of the upper), and owing to the force being applied close to the necks of the teeth, the undesirable leverage action of the roots is considerably reduced, thus confining as much as possible the action of the osteoclasts ahead of each advancing root and the action of the osteoblasts to the opposite side.

The appliances are not only regulators but also retainers, thus preventing the teeth from going back in case of unavoidable inability of dentist or patient to keep on with the work.

Occipital and facial anchorage can be utilized and the arches moved en masse without interfering with the function of any part of the appliances themselves. The method of applying intermaxillary reciprocal force, as well as the method of overcoming the resistance offered by the interlocking of the cusps, adds additional effectiveness to these appliances.

3rd—*The Most Hygienic.* Appliances which can be removed for meals enable the patient to maintain far more hygienic conditions than where

fixed appliances are employed. Gold plating can be renewed if necessary during dental visits. The patient's health is not impaired by inability to properly masticate and enjoy his meals owing to the presence of a fixed appliance.

4th—*Appliances Should Be Invisible and Not Interfere With Any of the Functions of the Oral Tissues.* The appliances are invisible except where the labial wires are employed, and these are unnecessary in most cases; and even when these wires are employed the patient is relieved to know that the appliances could be removed for a very short period in case good personal appearance should become essential. By a close adaptation of the appliance to the teeth, gums and palate, and by its removal at meal time the functions of the oral tissues are practically undisturbed.

5th—*The Least Expensive, Hence Requiring the Least Amount of Service from the Orthodontist.* The cost of the materials in the ordinary appliance is very slight, practically the entire expense lying in the cost of manufacture. The cost of manufacture can be very greatly reduced by the standardization and wholesale manufacture of the various parts, especially the palatal wires, which could be made in either one or two pieces. The writer has devised a method by which the entire appliance can be cast of gold clasp metal.

Its effectiveness reduces the duration of the time for treatment and number of dental visits. The time necessary to adjust the wires at each visit of the patient will depend on the complexity of the case and the orthodontist's ability to manipulate the wires.

It exacts no tedious labor at the chair from the operator.

Models showing the progress of the case and the condition of the bite can be readily obtained at all times.

Orthodontists using Dr. Bonwill's method of arch predetermination and having the diagram of the arch drawn on a transparent sheet of celluloid, as suggested by Dr. Bethel, can at all times readily compare the appliance with the prospective arch.

With appliances of the automatic type, intelligent patients can be entrusted in some cases with the simple adjustment of the parts, thus necessitating less dental visits or perhaps even continuing the work when on a summer vacation, etc. The orthodontist himself can go away at any time for a rest or vacation without fear of retrogression of the case due to the loosening of a nut or wire ligature. In many cases the work can be accomplished entirely without the use of separations, bands, nuts, screws or wire ligatures.

It is unnecessary to make a retaining appliance, as when the work is finally completed the appliances themselves can be used most effectively in that capacity and need not be discarded until the permanency of the work is assured.

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## MODERN METHODS OF PRODUCING LOCAL ANESTHESIA.

By **Herman Prinz, M. D., D. S., St. Louis, Mo.***(Continued from page 163, March Summary)*

## DISCUSSION

DR. CALLAHAN: The essayist has for data gleaned the four corners of the scientific world; in all languages and climes has he searched for more light on the points involved. To this he has added the results of his own labors. It is a source of great gratification to all those who are interested in the advancement of scientific dentistry to know that there is such a department as the St. Louis Bureau of Research of which Dr. Prinz is the dean.

Being more or less familiar with a most valuable, instructive and interesting text-book, *Dental Materia Medica and Therapeutics*, 1909, by Herman Prinz, M.D., D.D.S., the paper this evening reads to me like a revision or the rewriting of the pages devoted to Local Anesthesia, which may be found from page 443 to 511 inclusive, sixty-eight pages of the best and most conclusive exposition of the subject that the world has to offer. I have been at some pains to read some ten or twelve authorities (some of them translations), both medical and dental, along this line. There need be no fear of successful contradiction to say that if all be put in one, still they will not equal in completeness and practical value Part IV of Dr. Prinz's book. The paper of the evening is, however, a little more up-to-date. Naturally so.

I believe it will be conceded by all that an immense amount of damage and suffering has been brought about by the indiscriminate injection of cocain in its various forms in all kinds of surgical work. Men without any sort of conception of the physiologic or pathologic action of the drug, of dosage or the result of combination with other drugs, have gone blindly ahead in such work, evidently trusting to luck, so-called, or wrapped in a cloak of hopeless conceit born of ignorance. Fortunately these unfortunate results are not so common now as in the recent past. In the light that Dr. Prinz and other investigators have thrown on this subject, it may be well to study one or two typical cases. I know a dentist in this state who was doing quite a large business in the painless dentist line. In describing his methods, he said: "Dissolve a quantity of cocain in some water, then squirt it into the gums good and hard." I had been asked to see one of his bad cases, one that had gone wrong. He said the external plate of the mandible, from the third molar to the second bicuspid, was in an advanced state of necrosis—discharging at two fistulous openings. This was a case of squirting it in good and hard. Infection was not probable, because he was well up on asepsis, his office and instruments scrupulously clean.

No symptom of air embolism had shown. It is well, however, to keep this condition in mind. There is but little danger of forcing a harmful amount of air into the circulation if the simple precaution that is given in every text-book be followed—that of holding the syringe point upright and forcing the contents to the point of the needle. It is possible that the neglect of this simple precaution has cost many a life and cocain charged with the deplorable conditions produced by injected air. What did most likely occur in the case referred to was the raising forcibly, by stab or thrust, suddenly, of the periosteum from the bone, thereby some of the delicate blood vessels in this very vascular region may have been ruptured, leaving a blood clot between the bone and the periosteum, a condition known in surgery as subperiosteal hematoma. Ehrlich Lexer, in his great work on General Surgery, page 571, says: "The blood extravasation in such cases remains fluid and frequently is not absorbed for a long time. The loosened periosteum proliferates at points of attachment to the bone to form a thin wall of bone which surrounds the fluid blood like a wall," etc.



"Senn points out that when subcutaneous tissue is sufficiently damaged to preclude the possibility of a return of adequate circulation, necrosis follows as an inevitable result." Senn further says: "Necrosis is a condition, not a disease. As a symptom it represents a local condition which has been brought about by different causes."

The point which I am trying to demonstrate in the case referred to is that the deplorable condition of the jaw was due to the unscientific method of procedure. First, the bulk of the injection, meaning the presence of too much water. Second, the presence of cocaine without adjuvants to modify its action in any way. Third, the thrust of the needle followed by the favorite injection of the syringe content.

If the theories and very minute technic that have been so plainly set before us this evening by Dr. Prinz had been followed, the dentist would have been saved much worry and expense and the patient would have at least been spared much suffering and anxiety.

To my mind the application of cold in any form known to us at present is unsatisfactory and more or less dangerous and should be classed as one of the things of the past. The same may be said of cocaine, in the light of recent experiments and experience with novocaine, adrenalin and saline solutions. As I do not extract teeth in practice, my testimony in this line is based entirely upon injections for other purposes. I have used cocaine in aqueous solutions in the various forms of pressure anesthesia from cataphoresis up to high pressure syringe with varying degrees of success, depending upon physical conditions, both local and general, that have been referred to by the essayist. Of late years, however, or since the advent of novocaine, or more particularly since the appearance of the formulas advocated by Dr. Prinz that have proven so efficacious, my cocaine bottle remains closed—probably had better be thrown in the waste.

The high pressure syringe has given me good results many times; I have yet to see a pulp that shows evidence of being injured by such treatment in my own practice. I hasten to add that I am fully aware of the fact that we do not always see our own failures.

I have not made use of the subperiosteal injection for the purpose of desensitizing dentine or the removal of pulps. There seems to be strong evidence indicating the advisability of such procedure. Prof. Dr. Julius Scheff, Director Imperial Dental Institute of the University of Vienna, says: "Concerning the treatment of human pulps, the following is a brief general description of the procedure that was adopted, taking as an example the open pulp of an incisor tooth which had been artificially exposed. It was to be extracted without preliminary application of arsenic and was treated as follows: An injection of 1 c.cm. novocaine (2 per cent) and 1 1-2 drops suprarenin synthetic was administered, labial and palatal, half a syringe each. Ten minutes after the injection contact with the pulp proved painless.

"The cavity could be excavated as far as the entrance of the pulp channel without painful sensation, the cavity being closed at once with a temporary filling. After three days this filling was removed, the exposed pulp found bleeding and just as sensitive on contact as prior to the injection. The extraction of the pulp with a Donaldson needle, the point of which was dusted with cocaine powder, was accompanied with pain. The pulp, three days after the injection, had again returned to normal conditions, and this could also be demonstrated in all the remaining cases utilized for the same purpose, no matter whether a front tooth or a tooth situated farther back.

"The continued intactness of the neighboring teeth was demonstrated by the induced electric current and noted in the protocol. There was not a single exception among the clinical cases serving for the experimental treatment, and this was entirely borne out by the outcome of the histological examination. Numerous sections were prepared, showing in the human pulps as well as in that of dogs perfectly stained nuclei and repletion with blood from the capillary vessels. The author believes it to

be sufficient to point out these histological findings, and insists that this alone must be interpreted as a proof of the unchanged condition of the pulp after novocaine-suprarenin treatment."

Caution would seem to be indicated, especially if the average quantity of three drops for two syringes containing 1 c.cm. each is exceeded. Even with two drops of suprarenin to the syringe containing 1 c.cm. solution of novocaine (2 per cent.), the author repeatedly had occasion to note disturbances, expressed by general facial pallor, a tendency to syncope, tremor of hands and feet, actual fainting in isolated cases. The trouble did not last longer at most than two or three minutes, and the patients promptly recovered, so that the operation could be performed without difficulty at the end of five or ten minutes.

This rather lengthy abstract is placed before you as additional data as to condition of pulp after injection; also to remind us that, as with all other administrations to the human body, care and good judgment are at all times a necessity. The essayist has very properly shown us the danger as well as inconsistency in using ready-made obtundents, often without knowing the formula. Suppose, after using an unknown formula or even a doubtful formula, you find yourself the defendant in a suit for damages. The court says, "What is this compound composed of—what is the formula—are the people who compounded it reliable chemists?" You finally, under the influence of a cross-examination, have to admit that you don't know. What will be the verdict?

Novocaine, 1-3 gr.

Suprarenin hydrochloride synthetic, 1-1200 gr.

Sodium chloride, 1-8 gr.

One tablet dissolved in 20 minims of sterile water makes a 2 per cent. solution of novocaine, ready for immediate use, as proven and recommended by Dr. Prinz, are on the market, made by reliable people (Parke, Davis & Co. of Detroit), cheap, and can be had for the asking.

If in the face of these facts we persist in injecting unknown drugs and formulas into those who believe in us and trust us, we deserve the most severe condemnation.

DR. H. J. BOSART: Dr. Prinz has given us food for thought; something to carry home for future reference. A rare treat full of practical suggestions that will be of great value to all who are endeavoring to meet the demands of the laity for painless dentistry.

No one drug aids the dentist more in meeting this demand than cocaine, or some one of its substitutes. But why do we seek a substitute for cocaine? Cocaine is a dangerous drug; our writers of *Materia Medica* admit it when they tell us there is no way of foretelling how the drug is going to affect the patient in a given case, that it differs with different individuals and with the same individual at different times.

My only object in taking the floor in this discussion is the hope that Dr. Prinz, or some in the room, will be drawn into a discussion of this useful though dangerous drug and give us some much-needed knowledge that will make it possible for us to know beforehand if it is safe to use cocaine or its substitutes upon a presenting patient. (We have the knowledge at hand when and when not to use such general anesthetics as chloroform, ether or nitrous oxide.)

There are, no doubt, lesions of some certain organ or organs that, if known, would indicate when cocaine was not safe..

Dr. Prinz recognizes the superiority of cocaine, but also its toxic effects. In his efforts to find a substitute he has called to our attention novocaine, which is far less toxic than cocaine, reducing the element of danger in the proportion of its less toxicity.

Now I ask the doctor to go farther and tell us how to recognize in a presenting patient, when this drug is contra-indicated, and we will not then be embarrassed by finding out after the patient has collapsed that we should not have used it.

D. E. SHEEHAN, D. D. S.: When I received a letter from Dr. Prinz with his paper enclosed, I noted from the letter-head that he is the Director of the research laboratory of Washington University Dental School, in St. Louis.

The modern research laboratory is a most potent stimulus to medical science; no doubt it is the foundation upon which modern medicine rests today, lifting it far above the hazy empiricism of the past. Lord Kelvin once said that "Accurate and minute measurement seems to the non-scientific imagination a less lofty and dignified work than looking for something new. But nearly all the grandest discoveries of science have been the rewards of accurate measurement, and patient, long continued labor, in the minute sifting of numerical results." It is in the research laboratory that we find this "long continued labor, in minute sifting of numerical results." It is not strange then, that the habits that are inherent in the research laboratory should also dominate its Director, and that he so minutely covered the subject in the paper he has just presented to our society.

Not one in a hundred of the rank and file of dentists is prepared to carry out exhaustive research in making his choice of drugs for special usage. He has neither the special knowledge, skill nor apparatus at his command. Men of the type of our essayist delight in probing the ultimate nature of the materials with which we work. We of the rank and file find satisfaction in using for practical ends the results of their intensive experimentation.

In giving the history of local anesthesia, Dr. Prinz mentions the theory of Dr. Bonwill, who suggested rapid breathing as a means for producing it. This method is still frequently used in my office, in the handling of children especially. It assuredly puts them in a condition to withstand shock; intuitively the muscles become tense; it is the difference between resisting a shock when one is fully prepared and when one is not—a most common experience. Three or four deep inhalations just previous to minor operations will work wonders. The essayist did not comment on this theory; but I am convinced that if not a physiological, it is a psychological means for making many operations painless.

We also find ethyl chloride a very valuable adjunct in producing local anesthesia. We prefer Gebauer's metal containers with flexible nozzle, as it is then possible to direct the spray on any part of the mouth. With this tube it is also possible to regulate the flow of the ethyl chloride to a nicety; by using the most minute quantity the tissues may be chilled without necessitating the patient's inhalation of large volumes of gas. Many operations in the mouth may be made absolutely painless with this spray.

The discovery of cocaine, especially the hydrochlorate, was a great boon to painless dental operations. As our essayist suggests, the use of cocaine in combination with other drugs is preferable to the use of cocaine alone. Of the many combinations offered to the profession, my preference is the formula of Dr. N. S. Hoff, as prepared by Parke, Davis & Co. The tablet contains:

Cocain hydrochlorate, 1-2 gr.  
Morphine sulphate, 1-8 gr.  
Atropine sulphate, 1-200 gr.

Enough water added to make a 2 per cent. solution. There are many favorite prescriptions of many talented men, each more potent than some other in his own hands. It is sometimes merely a matter of the technic of injecting the solution which makes or mars its efficiency. However, the essayist has fully covered the technic of injecting solutions and any further comments would be superfluous.

The paper of Dr. Prinz being in the main a technical one, will make splendid food for thought and study when published later in THE DENTAL SUMMARY. Especially the part which treats of Osmosis. The medical and dental investigators would be guilty of the grossest neglect if they failed to comply with the laws regarding absorption of injected solutions. If the formulae of solutions do not comply with these laws, our



essayist warns us that they may prove to be active irritants. It is an interesting fact that after van't Hoff promulgated his theory many years passed before it became recognized in medical literature, because it met with unfavorable criticism among professional chemists. Now that it is uncontroverted, reputable manufacturing chemists will never make the mistake of ignoring these laws. Therefore, we should beware of using the thousand and one secret nostrums prepared by unscientific individuals who offer their products for sale.

The great fundamental ideas of any science are given to that science by a few great thinkers. These ideas are then elaborated; new channels of thought and investigation are opened; and were it possible to delineate this labyrinth of channels it might rival the spider's web in its complexity. The paper which we have just heard, representing the accumulated knowledge of many master minds, must needs be a beacon that lights the channel of local anesthesia and local anesthetics. As an appreciative member of this society, I thank Dr. Prinz for this light.

DR. ROBB: Where there is a deposit of pus, etc., is there any more danger from injection in removing calculus from this class of cases? It is usually very painful, and I think there is a common understanding between dentists that it is more dangerous in these cases, and I would like to have Dr. Prinz talk about that.

DR. H. T. SMITH, Cincinnati, O.: I want to ask Dr. Prinz whether he is acquainted with the Tandon apparatus, recently introduced by a dentist by that name in England. It consists of a combination of alveolar injection with that of cataphoresis. A mild cataphoric current is carried through the hypodermic syringe, which becomes the positive pole, the negative pole being a bifurcated one, and placed in the malar region on each side of the face. One advantage claimed for the apparatus is in the reduction of the percentage of cocain solution which may be used, a reduction from a 2 or 3 per cent solution to a percentage of less than one. The apparatus is not obtainable in this country as yet, but it should appeal to dentists who are as fond of cocain injection as Dr. Prinz evidently is.

DR. H. PRINZ, St. Louis, Mo. (Closing discussion): I have been very much pleased, indeed, with the discussion of my paper. There is comparatively little to say further on the subject. Regarding the poisonous effect of novocain as compared to other local anesthetics, or rather the recognition of cases where we could not use novocain with safety is, of course, very difficult to state. It is impossible to say when a patient may collapse under a local anesthetic. Probably all of you have had cases in your office where you were ready to perform an operation and where the patient collapsed even prior to the injection of the anesthetic. If this collapse should occur in the midst of an operation you would probably say that the anesthetic was at fault. You will all remember the story when Simpson first introduced chloroform. Simpson, being a very young surgeon at that time at the University of Edinburgh, had been called upon to demonstrate chloroform for an abdominal operation. Unfortunately, the chemist who had prepared the chloroform for him was late in bringing it, and while Simpson ran out to inquire about the chemist, the surgeon, having got tired of waiting, started to operate. The first cut had hardly been made when the patient collapsed and died within a few minutes. If chloroform had been administered in this particular case, it is quite certain that this anesthetic would have been held responsible for the death.

If prior to an operation a patient appears to be in a condition that indicates general derangement of the system and suggests collapse, cocain, novocain, or any other anesthetic is not indicated. If we have a patient suffering, perhaps, with severe diabetes, arterio-sclerosis, or other dangerous diseases of this nature, then we should delay the operation or perform it without a local anesthetic. It is merely a matter of using common sense to decide whether our patient shall receive a local anesthetic or not. As far as the danger of collapse is concerned, comparing novocain to any other local anesthetic, I think it is much in favor of novocain than with other drugs of this nature. In round figures, I have used novocain about 5,000 times and I have yet to see the

first case of collapse which could be solely attributed to this drug. I have been in correspondence with practitioners all over the country and with students which we have sent out in the past five years, and I do not know of a single case where I could tell you of a collapse resulting from the administration of this drug. But I could tell you of a number of instances where I have received reports from the use of cocaine and some of the ready-made proprietary solutions which are somewhat similar to the cases as recited by Dr. Callahan. Regarding the injection of any local anesthetic into a pus pocket, it should be remembered that it is a most dangerous procedure and, most emphatically, I wish to warn you against doing so. If, for experimental sake, you inject into a pus pocket plain water (leaving the use of a local anesthetic entirely out of the question) you create pressure; that pressure will drive the infection ahead into the sound tissue and you may set up a general infection and it may terminate fatally. If you wish to use a local anesthetic in such cases you must always inject into the sound tissues. The injection should be made in such a way as to completely encircle the diseased portion. Supposing that the tumor which I showed you on the screen happens to be a pyorrhea pocket, I would inject around that pocket and in due time we will have the tissues completely anesthetized, and we are now ready for curetting or any other surgical operation.

Regarding the apparatus which has been mentioned, I am frank to confess that I do not know anything about it. Apparently, it is a revival of the old method of cataphoresis.

In conclusion, I wish to thank you very much for the kind reception which you have given this paper, and I also wish to compliment you on the very good dental library which you have established in this city. Dr. Mills was kind enough to take me to the library rooms and show me what he has. I am greatly interested in it because we have in our school the well-known McKellops' library, and I happen to be its librarian. We have added to it from time to time and it is now quite a representation of the dental literature of the world. I am pleased to know that you, as a state association, have assembled these many books and have made them accessible to all of your members and to those who are not members but are anxious to find information. I found a number of journals which are not yet bound, and I understand that the funds which Dr. Mills has on hand have run very low. I would suggest that you would vote to him the necessary funds so that he may have the journals bound, because you cannot get at them when they are tied up as they are and put away in a corner. Your library has impressed me very favorably, indeed, and again I wish to congratulate you as a State Society for having supplied the means of establishing this most excellent collection of the world's record of dental science.

DR. JACKMAN: I want to ask you what experience you have had with different pressure anesthesia.

DR. H. PRINZ, St. Louis, Mo.: Regarding the principle of pressure anesthesia, it should be remembered that we cannot force a liquid through healthy dentin by a mechanical device without injury to the tooth itself. An attempt to force fluids by high pressure through sound living dentin into a pulp will result in failure. Walkhoff has tried to force colored solutions into freshly extracted teeth by applying six atmospheres pressure for half an hour without success. If a cocaine solution is held in close contact with the protoplasmic fibers of the dentin, the absorption of cocaine takes place in accordance with the laws of osmosis. The inhibition of the anesthetic is enhanced by employing a physiologic salt solution as a vehicle. Living protoplasm, however, reacts unfavorably against the ready absorption of substances by osmosis for two reasons: first, as Graham has shown, the albumen molecule is relatively large and not easily diffusible, and second, as an integral part of its life it possesses "vital" resistance toward foreign bodies.

These biologic facts, as stated by Walkhoff, describe in a pregnant manner some of the most important physiologic functions of the odontoblasts. The accuracy of this

dictum is easily demonstrated by the fact that it is almost impossible to stain living tissue, while dead tissue is at once penetrated by a suitable staining solution. Contact anesthesia is possible only when the medicament is placed on dentin in the form of a solution, and consequently dehydration of the protoplasm increases the endosmosis of the anesthetic solution markedly.

When we apply the same pressure anesthesia on carious dentin, the above statements do not hold good. We are able to press fluids quite readily through carious dentin. We must bear in mind that such dentin has been largely deprived of its inorganic salts, leaving an elastic, spongy matrix in position. The cartilaginous dentin should be suitably prepared prior to the introduction of the anesthetic solution—that is, the fatty deposits should be removed with chloroform, and the moisture dehydrated with alcohol and the hot air blast. If the anesthetic fluid is now confined under a suitable water-tight cover, the pressure applied by the finger or with an instrument is quite sufficient to obtain the desired result. Aqueous eosin solutions may be forced through such dentin in less than two minutes, and even thick layers of dentin may be readily penetrated by such colored solutions by slightly increasing and prolonging the pressure. It should be borne in mind that these experiments, if conducted with teeth out of the mouth, do not at all represent the conditions as found in teeth in their normal anatomic surroundings.

In teeth not fully calcified and in so-called “soft” teeth, pressure anesthesia is more readily obtained, while, according to Zederbaum, the process fails in teeth of old persons, teeth of inveterate tobacco chewers, worn, abraded and eroded teeth with extensive secondary calcific deposits, teeth whose pulp canals are obstructed by pulp nodules, teeth with metallic oxides in tubules, teeth with leaky old fillings, badly calcified teeth, mainly all from one and the same cause—namely, clogged tubules. In most cases no amount of persistent pressure will prove successful. The recent classic researches of Reich on the formation of irregular dentin have amply demonstrated that secondary deposits of dentin are much more frequently present in the pulp chamber than have hitherto been supposed. The histologic structure of secondary dentin, as observed under the microscope, frequently shows an irregular mass of twisted tubules, which have no connection with the odontoblasts. Such dentin, as well as the presence of pulp nodules, mechanically bars the forcible introduction of fluids into the pulp.

According to Hertwig, the protoplasm of the cell primarily transfers irritation, and, secondly, transmits absorbed materials, and therefore the anesthetic solution has to pass through the entire length of the dentinal fiber before the nerve tissue of the pulp proper is reached. Consequently a certain period of time is required before the physiologic effect of the anesthetic is manifested, and this period of latency is dependent on the thickness of the intermediate layer of dentin or bone. The successful anesthetization of the pulp depends largely on this most important factor of allowing sufficient time for the proper migration and action of the drug.

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## NITROUS OXIDE AND OXYGEN FOR SENSITIVE CAVITIES.\*

V. H. McAlpin, D.D.S., Warren, Pa.

Young man about 21 years of age. Mesial cavity in left upper lateral incisor and distal cavity in left upper central incisor. Applied 3 per cent oxygen with nitrous oxide, including a slight amount of air, through inlet in nose piece. After about a minute's inhalation the bur was applied to both cavities without pain. The young man complained of being sick at

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\*Clinic Lake Erie Dental Association, 1911.



the stomach, probably induced by fear, and it was thought best not to push the clinic further. The purpose of the clinic was accomplished, showing the painlessness of excavating under nitrous oxide and oxygen in anelgesic stage.

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### **PAINLESS EXCAVATION OF SENSITIVE DENTINE.\***

**By F. M. Howard, D.D.S., Pittsburgh, Pa.**

The clinic consisted of the desensitization of an extremely sensitive cavity in an upper first bicuspid. The tooth was isolated by the rubber dam, a pledget of cotton placed over the tooth and a spray of ether from a Hadley obtunder thrown upon the cotton for one minute, the cotton being used to lessen the initial shock of the cold produced by the evaporation of the ether. The cotton was then removed and the spray continued directly upon the tooth. In about two minutes the tooth was entirely devoid of sensation and was then prepared for filling, no pain at all being felt by the patient. The spray was continued during all the operation of excavating. No bad results have been noted from this system in my office during three years' use.

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\*Clinic Lake Erie Dental Society, 1911.

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### **MISUSE OF HYDROGEN DIOXID**

After all that has been written from time to time regarding the danger of using hydrogen dioxid in closed cavities containing pus, great harm is still being done by this agent. We see occasionally advice given in printed papers to use hydrogen dioxid for the treatment of putrescent pulp-canals, with the statement that the application should be continued till the effervescence ceases. Such advice is most dangerous. It leads practitioners to use this agent indiscriminately for the purpose of cleaning out pus pockets, while in reality its use for this purpose is quite likely to do more harm than good. The effervescence which seems to appeal so strongly to those who advocate hydrogen dioxid is frequently the pernicious means of carrying infection more deeply into the tissues. Moreover, it has been known to burrow beneath periosteum, stripping it bare for a long distance and inducing serious necrosis. It is but very rarely that in any abscess located within bony walls the condition is not aggravated rather than helped by hydrogen dioxid, and it is time that the profession be made fully aware of its dangers. It is sometimes advocated for cleaning out a diseased antrum, but it is safe to assume that this advice is usually given by a man who has never tried it in an antrum. The injection of hydrogen dioxid into an antrum that contains pus starts a volcano, as it were, which makes the patient imagine that his whole anatomy is being blown up. Even after the eruption has ceased so that the patient may breathe again, there is always grave danger of the bone being stripped by this agent. The safest way to use hydrogen dioxid in most of the diseases which dentists are called upon to treat is to discard it entirely.—*Dental Review*.

# CORRESPONDENCE

## PROPHYLAXIS

The January issue of your delightful publication contained a very polite criticism of my paper on Prophylaxis, in December SUMMARY, by Dr. G. F. Logan of Philadelphia.

I appreciate the nice way in which he calls my attention to what he supposed is an error of investigation on my part. This gives me the further excuse to again impress upon your readers the misconception and misunderstanding of this subject, which is undoubtedly the greatest cause of its not getting into more dental offices.

I, too, have a dental library, which includes many of the earlier books and dental magazines. Although I am familiar with the papers the doctor called my attention to, I again looked up Dr. Mills' paper of 1879, and even went further back and found that "*History of Dentistry*" of Guerini gives the same views of Oral Hygiene and cleaning the teeth as were recognized before the time of Christ. To this there can be no dissenting word, and right here is the source of prolific trouble with the profession, recognizing the spirit and interest of modern Prophylaxis.

Oral Hygiene and cleaning the teeth is a *part* of the scheme of Prophylaxis, but *only a part*. Some one has said that the twisting of wires is not Orthodontia, neither is Orthodontia the twisting of wires, although the orthodontists have to twist wires. In all schemes of Prophylaxis we have to use practically the same methods as common "cleaning the teeth," but we get further than this in that, not for the simple object of having the teeth look better, or feel good, but with a full knowledge of the anatomical, histological and pathological conditions as well as the theory of dental caries, to inaugurate some SYSTEMATIC and REGULAR PREVENTION TREATMENT. In this system each defect is carried fully in mind and worked out in a systematic, regular and scientific way for the cure and prevention of other lesions. I am surprised that Dr. Logan, living in the city in which Dr. Smith has worked these many years, is not more familiar with the work he has accomplished, and I again ask the doctor to look over his library and see whether he can find in any of his early books where any SYSTEMATIC and REGULAR SCHEME of PREVENTIVE DENTISTRY has ever been written up. If he cannot produce such proof, then he should be willing to give honor to whom honor is due.

As to the discovery of the word Prophylaxis, I have nothing to do, but I do know that this work is carried out in a *systematic* way by very,

very few dentists in the United States. I have recently made a tour of most of the larger cities of the United States, and I was grieved and ashamed to find that after reading so many excellent papers on Prophylaxis in the recent magazines so few of our profession had imbibed the true spirit for preventive dentistry, as they were not doing anything toward carrying out the systematic work along these lines.

Why this work is looked down on, and why it is not carried out, is beyond my comprehension, unless it is that a great number of dentists are under the same impression as Dr. Logan, that Prophylaxis is simply "cleaning the teeth." Prophylaxis, to my mind, presupposes a clean set of teeth and dental work, as nearly as possible, brought to the standard, then its object at regular and set intervals by some scheme of regular engagements to renew these treatments at a near enough time to prevent any pathological condition arising. Every dentist interested in this question should read the article of Dr. Spalding in *Dental Cosmos*, August, 1910. I am not personally acquainted with Dr. Logan, but I hope that he is doing something in his practice along the line of Prophylaxis; as he seems to be so well informed upon the papers which have been written upon the subject in the past, I would myself offer the suggestion that the doctor look up the papers from men like Drs. Spalding, Kelly and Smith, the leaders of the modern conception of Prophylaxis, and compare with the earlier views he mentions, then I think he will see that Prophylaxis as now advocated is rather different and NEW.

Yours very truly,

ROBIN ADAIR.

319 Grant Bldg., Atlanta, Ga.

## OBITUARY

### WILLIAM H. GILBERT

THE DENTAL SUMMARY announces, with regret, the death, on Saturday, March 16, of Mr. William H. Gilbert, for many years president of The S. S. White Dental Manufacturing Co., at an advanced age. Mr. Gilbert has been identified with the dental business for such a long period that the announcement of his death will be received with sorrow wherever dentistry is practiced. His successor has not at this writing been announced.

But what are past or future joys?

The present is our own;

And he is wise who best employs

The passing hour alone.

—Heber.



# THE DENTAL SUMMARY

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MAY, 1912

No. 5

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The Indiana State Dental Society  
The Kentucky State Dental Society  
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## POST INLAY ATTACHMENT FOR BRIDGE-WORK\*

By James H. Linsley, D.D.S., Ashtabula, Ohio

Since the advent of the cast inlay it has given to the dental profession many varieties of crown and bridge attachments. One that the profession has always tried to overcome is the gold crown and its many offsprings. In making abutments for bridgework, we nearly always first take into account the mechanical difficulties and then we try to work for the esthetic effect. The post inlay attachment seems to me to have overcome, to a large degree, both of these conditions.

The gold crown is always a source of irritation to the gingivae, and people who have any esthetic pride always object to its being used. The Richmond crown, with its many different kinds, is also a source of irritation to the gingivae, and besides we have to supply the natural tooth with a

\*Given as a clinic at Ohio State Dental Society, 1911.

porcelain one. Now the post inlay attachment can be used and all these difficulties removed.

There are many ways of using the post inlay attachment, but the ones that have been the most satisfactory in my hands and the ones that seem to make the strongest attachment are the ones shown in the cuts.

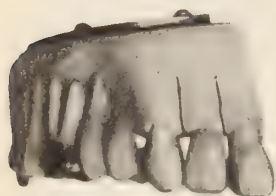


Fig. 1-B

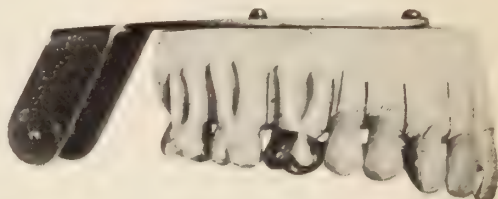


Fig. 2-B

Many times we have patients who have lost an anterior tooth, and we are at a loss to know how best to supply it. Nearly always in these cases we have a cavity in either approximal side that can be used for a post inlay attachment, where so many times we find that an open-face crown has been used, and to my mind is but little better than an all-gold crown. The post inlay, when completed in these cases, makes a very beautiful piece of mechanical work.

I think the cuts will tell one how to make one of these bridges. But one thing always be sure of, that is, that you have *direct* access to the root



Fig. 1-A

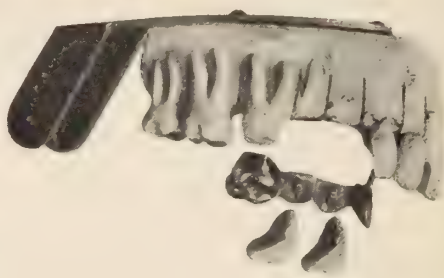


Fig. 2-A

canal, or in other words, a long, straight wire inserted into the canal should be in parallel line, or nearly so, with the long axis of the tooth.

In cut No. 2 we have a type of a bridge that we are called upon to insert so often and where we would like to do away with crown. This kind of an attachment, to my way of working, is ideal. And with the many different kinds of all-porcelain crowns on the market, one can very easily make a very beautiful piece of work.

## A MORE PERFECT METHOD OF MOUNTING A PORCELAIN CROWN\*

By A. W. Boyd, D. D. S., Cambridge, O.

1st. Select crown suitable to the case in regard to color, mould and sufficiently large to cover surface to be exposed.

2nd. Inject local anesthetic in the free margin of the gum, labially and lingually.

3rd. With a small knife edge stone, mark the tooth close to the free margin of the gum, labially and lingually.

4th. Adjust rubber dam, including at least three teeth; do not use ligature. With Ivory's cervical clamp No. 9 force the gum back sufficiently that the joint will be safely concealed when the work is finished.

5th. After removing pulp and sealing the apex, remove broken down crown, prepare the root sufficiently short and just the shape of free margin of the gum, using the mark previously made as a guide. I prefer to do



the final shaping of the root with a large bur about the same size in circumference as the root.

8th. Enlarge the canal only sufficiently to receive the pin of the crown.

7th. Grind the crown to fit root, using thin carbon paper disks to assist in making a perfect joint.

8th. Place small amount of soft gutta percha around the pin on the ground surface of the crown, moisten the exposed surface of the root, warm the gutta percha on the crown and press crown into position.

9th. Remove crown, on which you will have an exact impression of the exposed surface of the root.

10th. Grind the neck of the crown to the same size and shape as the exposed surface of the root. Polish crown perfectly smooth, ready for final adjustment.

11th. Mix cement to proper consistency with a small probe, fill root canal from apex down, press crown firmly into position.

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\*Given as a clinic at Ohio State Dental Society.



12th. After cement has sufficiently hardened, polish any portion of the joint that might not be perfectly smooth with a strip or disk, as the case may indicate. If this method is carefully followed, the three most common failures of the porcelain crown will be eliminated, namely, irritation of the gum tissue, exposing cement line, and eventually the loss of the crown.

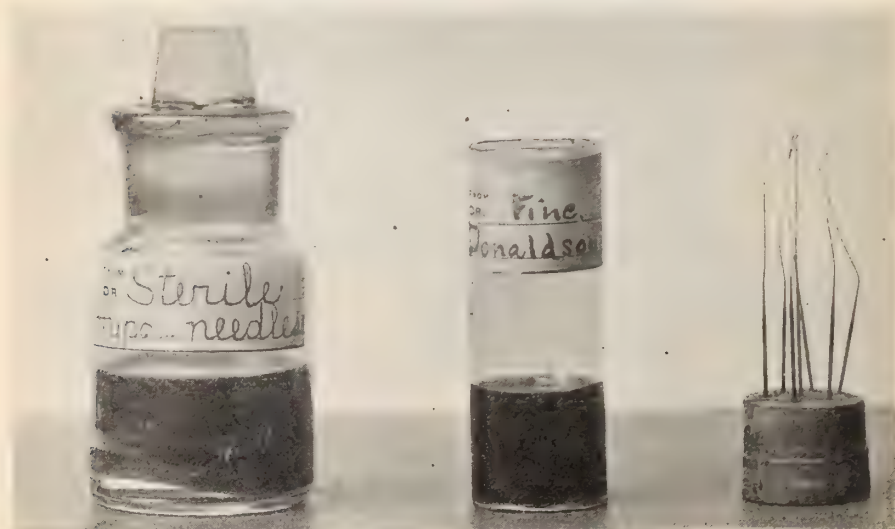
## A SIMPLE AND INEXPENSIVE METHOD OF KEEPING STERILE BROACHES AND HYPO-NEEDLES CONVENIENT\*

By W. G. Hamm, D.D.S., Chillicothe, O.

A MERE GLANCE at the illustration of this method will convince the most fastidious of the very essential need of and most practical way to execute aseptic root canal surgery.

Not only will it keep the broaches sterile, but will prevent rust, and keep hypo-needles from clogging.

The small bottle in illustration, with cork removed, holds six broaches which are ready for use.



Take glass tube-bottles—Rowan's, Nelm's, Ney's or any other that are constructed without a neck and have straight sides and flat bottom. The usual gold pellet bottle is the one that I use and is prepared as follows: Take the bottle to a knife-edged carborundum stone and cut a ring around the bottle where you want to sever it and keep going around a few times and the bottle will break clean without jagged edges. The one illustrated is  $2\frac{1}{4}$  inches long for unmounted broaches. Then secure a good hard cork and take the six broaches that usually come in package, insert the ends

\*Given as a clinic before the Rebwinkel Dental Society, Feb. 17, 1912.

that are fastened in broach handle (which are usually pointed) into the bottom end of cork and the broaches are ready for immersion into the liquid in the bottle, which is composed of equal parts lysol and alcohol, a sufficient quantity to cover well over the barbs or about one inch from bottom up; insert broaches barb side down, tighten cork and your miniature sterilizer is in operation. Before using the broach shake the bottle slightly.

Lysol and alcohol combined in this proportion makes a very compatible solution that is nearly odorless and a very efficient antiseptic without the objectionable caustic properties of so many drugs of this group. Lysol is an excellent sterilizing lubricant for broach manipulation in canals; it is ideal on the broach in using sulfuric acid; try it and be convinced. I think that all know the action of alcohol without my going into detail.

The fixed handle broaches can be kept in a test-tube in the same manner, keeping them in an upright position. I keep all kinds and makes of broaches in this solution. I am now making an experiment which make of broaches are most durable under such conditions, and will make a report later of the results.

The glass stoppered bottle illustrated contains hypo-needles under a solution of lysol one part and alcohol three parts; this makes a splendid anti-clog, always ready needle sterilizer. After using a needle it need not be thrown away or left in the cabinet dirty; when through using the syringe with needle attached, pump the plunger of the syringe up and down a few times to clear out as much of the liquid as possible, then unscrew needle from barrel, take chipblower and blow air forcibly through the needle from the hub end, this clears the canal of the needle from moisture and clog material, then drop the needle into this solution and keep the bottle tightly stoppered: having occasion to use the needle again, shake the bottle slightly and with a clean plier pick out the needle, wipe it off dry, using the chipblower again in the hub end, fasten needle on barrel again and you have a clean, reliable needle, with a minimum amount of danger for infection so often caused from dirty needles forcing septic matter into cellular tissue.

It is understood that you have not a *permanent solution* for sterilizing both broach and needle if you do not often change to fresh solutions in the bottles; it should be often changed, say once a week in an ordinary practice, when the solution becomes very flakey with precipitation it must be changed. Have your druggist make you a quantity of it and always keep it in stock to freshen up and assure you of immaculation.

God gave you a mighty capital in a brain, six senses, and the machinery to do things. It is up to you to make this asset pay interest.

—John Emery White.

## THE RELATION OF THE TEETH TO LONGEVITY AND TO DISEASES OF THE DIGESTIVE ORGANS GENERALLY.\*

By A. L. Benedict, A.M., M.D., Buffalo, N. Y.

THE subject assigned by your committee was suggested by an article in the Independent of August 11, 1910, by J. C. Bayles, M. E., Ph. D., claiming that the artificial preservation of the function of mastication, by the skill of your profession, into a period of life when, formerly, the majority of the race were more or less toothless, leads to a continuance of habits of hearty eating beyond the assimilative power of the elderly, and thus tends to cause disease and shorten life.

Before attempting to discuss the question in an argumentative fashion, it may be well to point out that the U. S. Census Reports for the area in which vital statistics are secured by compulsory registration, show a gradual and quite steady decline of the aggregate death rate from 19.6 per thousand of population for 1890 to 15 per thousand for 1909. The average age at death, meantime, has increased from 31.1 years to 38.8 years.

At first thought, we might conclude that these statistics leave nothing more to be said. However, while the average span of life has been lengthened by more than seven and a half years in the last nineteen years, both this increase of longevity and the marked diminution in death rate and incidence of disease, are largely due to conservative measures applied to infants or, at least, to the population generally. Moreover, so many factors have tended to diminish infectious disease, to improve the hygienic conditions of the person, the home, the work room, etc., that such statistics, however reassuring, cannot be applied to the particular question under discussion. On the other hand, it is significant that the writer of the article mentioned is neither a dentist nor a physician, and his argument, however plausible, is not supported by statistics.

The generality of mankind are prone to assume that anything which is not natural is evil. Curiously enough, however, they speak of a natural death, when a person dies in bed from the result of his vices, carelessness, the inroads of an artificial life of mental strain and bodily inactivity: even of the implantation of bacteria in his body. There are only two kinds of natural death, in the strict sense: some kind of violence and old age, though, as a matter of convenience, we may recognize as a third variety, the overthrow of resistance by various minor exposures, strains and extrinsic but practically inevitable factors, although death in the third group may be regarded either as a form of violence or of premature senility.

Man ceased to lead a strictly natural life from the time that he used any kind of artificial protection against the weather, wielded his first crude weapon or made fire either to warm himself or cook his food. There

\*Read before Eighth District Dental Society of New York.



is no archæologic evidence of the existence of man in this suppositious, purely natural state. Obviously, there could be none in the strict sense of the word archæologic nor is there geologic evidence in the form of a sufficient number of human remains unaccompanied by artefacts, traces of fire, etc. It is scarcely necessary to state that there is no contemporary nor historic observation of a tribe of men living in a state of nature.

Whether there ever was a time when man lived like the wild animals or not, it must be conceded that, as his development has involved more and more highly artificial habits and environment, certain special dangers have developed for him, which do not threaten the lower animals, or at least those which he has not taken with him into a more or less artificial life. It is a matter of common sense that these dangers, arising artificially, must be combated artificially.

Accompanying and, indeed, forming a part of the popular conception that anything that is not natural is evil, is the generally accepted idea that man, especially in a state of civilization, is a very weak, degenerate creature. But this idea is scarcely supported by fact. Discounting the greater incidence of violence in savage tribes, their longevity does not exceed if, indeed, on the average it equals, that of civilized man. Excepting exposure, strain and extrinsic factors such as infections to which some particular race has become, so to speak, acclimated, civilized man shows as great resistance to causes of disease and death as a savage while, in the ability to adapt himself to marked changes of environment and habit, he is far superior. With an analogous qualification, he also shows greater physical strength than the average savage.

Contrasting man with the lower animals, we find only a few mammals, birds and fishes which have a greater longevity, while the vast majority of lower animals die of old age, actually presenting senile lesions at or before the period at which man reaches adult life.

It is true that, from centuries of more and more highly artificial habits and environment, man has allowed the development of a greater number of specific gross parasites and infectious bacteria than attack any other single species of animal, but in the aggregate there seem to be more kinds of parasites, including disease germs, which affect one or several species of lower animals and to which man is immune, than conversely. So, too, in the aggregate, man, and especially civilized man, seems to suffer less from these parasites than animals leading a natural existence.

In many individual ways man shows a greater resistance than the lower animals. The cat, proverbially possessed of nine lives, succumbs to anesthetics much more readily than man. The guinea pig, and even cattle, are much more susceptible to tuberculosis. A horse, allowed to drink cold water when heated, or to eat his fill of green grain, is in serious danger of death, whereas man, after analogous indiscretions, fails to feel any immediate effect or has a transient colic. It is said that a horse will suffocate in an inclosure where a man will merely awaken with a headache. Only

in a few epidemics can men be said to "die like sheep." Alcohol, tobacco and poisons generally affect man proportionately less than the lower animals though, for various reasons, there are numerous exceptions to this rule. Barring the differences of susceptibility to certain poisons and microorganisms—which, indeed, are producers of toxic substances—it is a good general rule, though doubtless requiring some qualification, that every pathologic process known in man is duplicated in the lower animals and that, in general, the pathologic response to a relatively equal extrinsic cause is less in man than in the lower animals.

It has seemed worth while to devote some time to dispelling the fallacious conception that progress from a state of Nature, typified by the life of the wild animal, means a greater and greater physical handicap. This conception underlies not only the argument of the author, whose article your committee has selected as a sort of negative text for mine, but upon it is based a great mass of pseudo-hygienic literature and various cults purporting to minister to the health of civilized humanity.

The statement that the preservation or artificial replacement of teeth leads to a relative gluttony in old age is important if true, for there can be no question but that greater temperance in all things, including the taking of food, is necessary in old age and that, more generally, the old man or woman who relies upon any kind of artifice to continue in any way the strenuous life of youth, must pay the penalty. But so far as my own observation is concerned, the statement is not based on actual fact. On the other hand, inadequate nourishment, pain, toxic conditions arising in neglected teeth, occur much less frequently than formerly, thanks to your profession.

It must also be considered that senility, though to a degree inevitable and measurable in years, does not begin at any stated period nor from any single process. Other things being equal, and with due allowance for intrinsic and inexplicable individual factors, old age may be defined as the gradual accumulation of pathologic conditions in various organs and tissues. Contrast two individuals, one exposed to cold, damp and fatigue, or to alcoholic or other excess, or to a series of infections, with one protected against such factors. The former tends to grow old more rapidly. It is reasonable to believe that the preservation of the teeth, not only in the positive, physiologic sense of maintenance of a function but in the negative, pathologic sense of avoiding malnutrition, the introduction of causes of fermentation, pain and local disease including septic processes, actually delays senile changes. At the worst, in common with many devices of medical practice in the limited sense, the cosmetic arts and the habits of modern life, the tendency is to lengthen the period of youth and to cut short that of old age.

It is unnecessary to remind you of the mechanic value of mastication in subdividing the ingesta into fragments sufficiently small to be reached by the digestive juices nor of its indirect chemie value in mixing the food

with saliva which contains a ferment capable of converting cooked starch into maltose, nor of the reflex nervous influence of mastication on the gastric secretion.

But it may not be out of place to protest against certain extreme pseudo-hygienic fads. Food, Fletcherized into a fine pulp, is not sufficiently stimulating to the musculature of the stomach, not to mention the intestine. Ptyalin digestion is a much overrated function. At most, only the cooked starch is partially digested, and unless the bolus is held for an undue length of time in the mouth or the stomach is abnormally low in hydrochloric acid, only part of the cooked starch is digested. Granted that by extremely dilatory habits of eating, most of the starch ingested will be converted into a sugar by ptyalin, why should we try to nullify the much more energetic starch digesting power of the pancreatic ferment amylopsin? Moreover, in so doing, the reflex nervous influence of mastication will either have been prolonged to a tantalization of the gastric glands or the stimulation will have been succeeded by an inhibition. It may further be stated that actual analyses of stomach contents have shown that the addition of a moderate quantity of water to a meal facilitates digestion and that the supposedly hygienic practice of eating the meals dry and flooding the stomach with water two or three hours afterward is a much worse evil than the supplanting of saliva.

There can be no question, however, that mastication should be reasonably well performed. Otherwise many foods, especially meat, vegetable starch inclosed in cellulose, as in most leaves, stalks, roots, tubers, etc., and pill-like seeds and fruits, as peas and huckleberries, pass through the body undigested. We may view with equanimity the waste of nourishment, either from the standpoint of domestic or of physiologic economy. But a mass of food which is not digested is liable to be attacked by bacteria of fermentation, rancidity or putrefaction with the production of harmful substances. Moreover, hard and relatively large masses, impinging on the pylorus, cause spasm and delay of gastric digestion, may lodge in the intestine or, on the other hand, may produce an irritative diarrhoea which involves not only a loss of nutriment but is, in itself, a diseased condition.

But it would be a very narrow view to conceive of your profession as simply an aid to mastication and insalivation. The man who does not masticate may be merely careless; the man who cannot masticate on account of bad teeth has in each dental cavity and in each interdental space which favors the lodgment and prevents the ready egress of food particles, a culture tube for microorganisms. For the most part, these germs are those of fermentation, rancidity and putrefaction, respectively or jointly. Thus both, by allowing masses of food to escape the digestive juices and by actually inoculating them with bacteria, yeasts and hyphomycetes, does the patient with neglected teeth tend to have abnormal ferment processes in the lower alimentary canal.



Nor are the germs present in and between teeth merely saprophytes. The germs of tuberculosis, diphtheria, pneumonia, actinomycosis, etc., have actually been demonstrated in such culture niduses.

Furthermore, various local septic processes of the gums, jaws, antra, etc., often develop from strictly dental lesions. It is by no means imaginary that these processes may extend by continuity or contiguity of structure, so as to produce extremely troublesome, occasionally fatal, lesions or that the septic process may develop into a true generalized pyemia, which almost inevitably means death.

Without going beyond the ordinary lay conception of dentistry as tooth-pulling, tooth-filling and platemaking, we may find in bad teeth another unfavorable factor which is often underrated—pain. It is doubtful whether the most ingenious mediæval inquisitor, the modern vivisector, or the most piously orthodox ecclesiastic in his contemplation of the hereafter of those who differ from him, can establish a higher standard of pain than may be experienced from certain dental lesions. Pain is not a mere temporary evil—it is a shock and damage to the resisting powers of the body and an inhibitor of all kinds of physiologic function.

With no attempt at completeness, either of diseases considered or of the causative factors involved in their production, it may be of interest to point out the relation of bad teeth to diseases of the more deeply-seated digestive organs and, by implication, to show how dentistry may be of service, either prophylactically or therapeutically, or in both ways.

Gastric neuroses, both of secretion and of motion, either in the direction of excess or deficiency, may depend upon improper reflex stimulation from the act of mastication. Imperfectly masticated and by reason of their germ content, chemically abnormal masses of food tend at first to stimulate secretion and to produce an excess of gastric peristalsis resisted by spasmodic contraction of the pylorus. In accordance with a general law, any such irritation, long continued or repeated, tends to produce fatigue and the opposite condition of secretory depression and muscular atony.

Gastric catarrh is also due to irritative factors and, according to Fenton Benedict Turck, of Chicago, is especially connected with the actual colonization in the mucosa of bacteria which, as has been stated, are nurtured to an excess of numbers and virulence in dental and interdental niduses.

Gastric ulcer is unquestionably due in many cases to the digestion of the gastric wall by its own juices, favored by an excess of hydrochloric acidity, although few have earlier or more insistently than the writer protested against regarding gastric ulcer as solely due to this effect. The influence of dental lesions in causing an irritative excess of hydrochloric acid has already been implied. Furthermore, the stormy peristalsis and long retention of stomach contents by pyloric spasm, due to imperfect mastication, favor this process of self-digestion. The colonization of bacteria in

the gastric wall just mentioned as part of the pathogeny of gastritis, obviously applies to ulcer as an etiologic factor. Self-digestion must probably be preceded by death or at least suspension of vital processes in the part attacked. Pertinent to this prerequisite is the local spasm of gastric muscle or of gastric vascular muscle and the shock to trophic nerves, if there be such nerves, due either to motor disturbances of the stomach or to pain, and hence to bad teeth.

*Gastric Dilatation.* It is obvious that a stomach subject to stormy peristalsis, with spasmodically contracted pylorus, ultimately reaching a stage of muscular fatigue and atony and with fermentative bacteria producing gaseous distention, especially if the wall of the organ is further weakened by catarrhal or ulcerative processes, is extremely liable to dilate.

*Gastric Cancer.* While the essential cause of no disease is more vaguely understood than that of cancer, and while it may supervene in an organ apparently in perfect health previously, it is generally accepted that gastric ulcer predisposes to cancer, and I have shown statistically that the great majority of cancers occur in parts having an acid reaction, especially that due to fermentative processes. Likewise, it is generally agreed that various irritations, mechanic or chemie, especially if repeated for a long time, favor the development of cancer.

Various irritations, directly from the impingement of undigested masses of food, less directly from bacterial processes in these masses, from irregularities in the discharge of normally acid gastric contents into the duodenum, still more remotely from interferences with intestinal digestion and motility, tend to produce inflammatory processes in various parts of the intestine. Fragments of decayed teeth and loosened fillings, even small prosthetic appliances, have been found in the appendix. In my opinion, inflammation of the appendix is of the same general causation as and, indeed, ordinarily part and parcel of a more general colitis, this little organ becoming conspicuous simply because its tissues are less resistant, more inflammable by reason of the relative excess of lymphoid tissue and because within its closed cavity ordinary bacteria are more prone to multiply to the extent of producing ulcerations that lead to penetrating septic processes. In so far as dental lesions predispose to the passage down the alimentary canal of irritating masses, and especially of bacteria, they may be considered etiologic factors of an inflammation of the appendix. I am also inclined to believe that an appendicitis following an ulcerated tooth may be regarded as due to septic conveyance by the blood, not to mention the general predisposition to septic inflammatory processes which the tedious dental lesion produces, even by exhaustion.

The most common serious liver disease of this climate is sclerosis, with more or less associated fatty change, warranting the more frequently used term, cirrhosis. This has usually been ascribed to alcohol, but my cases show about an equal distribution between total abstainers and moderate drinkers in proportion to the numbers of these classes. It certainly seems

to depend upon various fermentative and putrefactive changes in the alimentary canal and has been experimentally produced in animals by indol, which results from proteid putrefaction. The relation of dental caries to such processes has been sufficiently described.

In addition to various predisposing causes which it would take too long to describe, gall stones are commonly ascribed to typhoid and colon bacillus infection. While it would be far-fetched to attribute typhoid fever to the development of a few bacilli to a potentially infectious number in a cavity of a tooth, or to lessened antiseptic resistance from inhibition of gastric acidity due ultimately to bad teeth, as described, there can be no question but that many conditions of excess of colon bacilli in the intestine are pretty directly due to dental causes.

Pancreatic diseases are explained somewhat on the lines of hepatic, and Opie has well established the dependence of certain pancreatic lesions upon the ball-valve action of a gall-stone in the common duct. Thus, even for this organ, a connection with dental lesions may be traced.

Either directly due to portal vein obstruction from hepatic sclerosis or as part of the general intestinal inflammatory and congestive process, it is even possible to ascribe piles, that common and distressing, even dangerous, condition of the lower terminus of the alimentary canal, to lesions of the teeth at the opposite extreme.

Do not understand me to make the sensational claim that all these diseases and others, not mentioned but implied, are universally and exclusively connected with dental lesions or that they may not often develop in persons with normal or restored dentition. But there is no doubt but that your specialty has a genuine and important bearing upon the lesions of the lower alimentary canal and its tributary glands. Nor should we stop here. In all probability, specialists along other lines could similarly trace a connection between the teeth and the organs with which they deal. At any rate, it is suggestive, if not significant, that among the inmates of insane asylums, poor houses, institutions for all sorts of defective humanity, including dispensaries, dental lesions and defects are much more common than among the more fortunate.

This paper would fail of its purpose if it were regarded merely as a compliment to your profession by emphasizing, on the one hand, the importance in much more than a local sense of the organs in which you are interested and, on the other, the far-reaching value of your skill in a prophylactic and therapeutic way. Such realization of the essential unity of your field of labor with that of medical practice in general carries with it an appreciation of the practical, every-day necessity of cooperation with the medical practitioner to secure the welfare of the whole body.

**"We are judged by what others think of us, rather than by what we think of ourselves."**



## BISMUTH PASTE IN CHRONIC SUPPURATIONS OF THE JAWS, ITS DIAGNOSTIC IMPORTANCE AND THERAPEUTIC VALUE.\*

By Rudolph Beck, D.D.S., Chicago.

SINCE the publication of my former contributions on the use of bismuth paste in chronic alveolar abscesses, fistulae and pyorrhea alveolaris, the subject has aroused sufficient interest to justify me in bringing it again before the dental profession and reporting further experience with this new therapeutic agent. I shall try to bring out more clearly such points in its use as are not clearly understood and describe the most recent advance in the technic which has enabled me to obtain the best results.

For the past three years I have, on several occasions, presented to the dental profession in papers read before dental societies and by practical demonstrations at clinics, a method of making a correct diagnosis and successfully treating alveolar abscesses, sinuses and pyorrhea alveolaris by means of injecting bismuth paste.

This agent was first introduced into general surgery by Dr. Emil G. Beck, of Chicago, consequently it is not necessary for me to dilate upon its merits in that branch of the profession as, no doubt, most of you are familiar with the remarkable success which has attended its use in all parts of the world.

Since the principles of general surgery are applicable also to dental surgery, and the pathology of sinuses of dental origin is the same as that of other parts of the body, we are justified in resorting to this simple method of treatment which in general surgery has proven to be of such great value. In dentistry the method has been found useful in the treatment of chronic alveolar abscesses and in pyorrhea alveolaris. I shall discuss each of these separately, but not their etiology and pathology, only touching briefly upon these phases in so far as they pertain to bismuth paste treatment. I desire, however, to mention a few general surgical principles which govern nearly all healing processes and which have a direct bearing upon the causes of healing and upon the causes of failure.

It is a well known fact that infections, whether acute or chronic, have a tendency to spontaneous healing, providing the physical condition of the individual is not below a certain standard, which is governed by general or local conditions.

The protective agents in the body, such as antitoxins, antibodies and the action of the white blood cells, play an important part in preventing a rapid spread of the disease. Immunity, local or general, and a predisposition to infection, depend upon several factors:

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\*Read before the Lake Erie Dental Society, 1911.

1. Oft-repeated exposures to prolonged and mild local infections will produce local and general immunity.

2. The different types of cellular structures have varying degrees of resistance. The highly organized cells are less resistant than the coarser connective tissue cells.

3. Denudation of mucous membrane and lack of blood supply also favor infection.

4. In the struggle between the invading germ and resisting forces of the body, inflammation is always present, and in many instances the inflammatory process terminates in suppuration. This, however, does not always occur in the soft tissues around the teeth as in other parts of the body. With these general rules in mind, I will proceed to consider the diagnosis and treatment of:

1. *Chronic alveolar abscess.* The origin of an alveolo-dental abscess is supposed to be due to either the death of the pulp and the subsequent infection by the invasion of micro-organisms. The infected material passes through the apex of the root into the invading alveolo-dental membrane. The process may also be due to an injury of the alveolo-dental membrane and followed by infection without involving the dental pulp.

The abscess is not always a single sac of pus; it may have an irregular shape and connect with other abscesses by small channels. After an abscess has broken or has been opened, it may terminate in a sinus.

A sinus is nearly always preceded by an abscess. When the abscess becomes chronic, its connective tissue walls become thickened. It is not always a very simple matter to point out the tooth involved in a chronic alveolo-dental abscess with a fistulous opening, especially when two or more teeth are present on the same side of the jaw and when in more than one of the teeth the pulps have been removed and the roots previously filled. The sinus frequently opens at a distance from the seat of the disease, as has been proven by radiographs.

The metal probe is not always reliable, because the course of the sinus may be very tortuous, and the focus of the disease remote from the opening. This uncertainty as to the origin of the abscess leads often to unnecessary exploration of pulp canals. Only the most skilled interpreters of skiagraphs are able to make a diagnosis.

The method I am about to outline is one which has unquestionably given the most satisfactory results for correct diagnosis. It was in this connection, namely, for diagnostic purposes, that bismuth paste was first employed and later found to possess also the property of curing suppurations.

#### TECHNIC OF INJECTIONS IN CAVITIES AND SINUSES

Without any further preparation of the sinus, the paste (which consists of bismuth subnitrate 30 parts, vaselin 60 parts, paraffine 5 parts and wax 5 parts) is placed in the barrel of a metal syringe, the tip of the flexible silver applicator is introduced into the opening of the sinus, and

then by steady and gentle pressure upon the piston of the syringe, the paste is forced into the remotest parts of the diseased structures.

Immediately after a radiograph with parts involved is taken. It is well known that bismuth produces a shadow on a sensitized plate when exposed to the action of the X-ray. A picture thus obtained will outline with perfect clearness the boundaries and ramifications of the sinus and trace the path to the original focus of the disease.

Stereoscopic radiographs are of much greater value because the picture will bring forth in relief the structures, hence we are in a position to determine whether the paste runs in front of, behind or through the jaw.

#### TREATMENT OF SUPPURATIVE DISEASES OF THE JAWS BY BISMUTH PASTE

Under this heading we include sinuses, fistulae, or abscess cavities of the jaws, regardless of the origin of the infection. There is, however, one class of cases not suitable for injection, namely, those that are associated with very acute inflammatory conditions.

#### CHRONIC ALVEOLO-DENTAL ABSCESS WITH SINUS

It is very essential that a thorough examination be made in each case. The X-ray picture should serve as a guide in establishing a correct diagnosis before any treatment is attempted. If we find that the pulp canals are properly filled it is not necessary to disturb them. The technic for injecting the paste for its curative effect is the same as described for the purpose of taking a skiagraph for diagnostic purposes. I would emphasize the necessity of taking the greatest care in forcing the paste throughout the entire tract to the remotest point of the infection, as technic is of paramount importance. Should any portion of the diseased area be missed, failure will result. The case may apparently heal and remain so for some time, but ultimately the entire tract will become re-infected by the secreting pus.

Another important factor to be observed, if a cure is to be expected, is the removal of foreign bodies or sequestrum when found present. It has been my experience that in the treatment of chronic alveolo-dental abscesses, where the roots were already filled, and the paste injected through the opening of the sinus, a fair percentage of cases were cured after one injection without operative interference. If, after a reasonable length of time, the sinus shows no tendency to close, I resort to the simple operation of exposing the apical portion of the root, excise the same, then thoroughly curette the walls of the abscess cavity, and pack with antiseptic gauze for 24 hours, to control the hemorrhage, after which I remove the pack and inject bismuth paste. Here the paste serves a double purpose:

1. It prevents infection.

2. It acts as an excellent dressing and promotes the rapid growth of healthy granulations. At any rate, this simple method should precede any operative treatment.



## EMPHYEMA OF THE ANTRUM.

Only those cases that are of dental origin should be treated by the dentist. The more frequent cause of empyema of the antrum is an infection of the ethmoid cells, and if this is the case the patient should be referred to a rhinologist for treatment. Upon making a correct diagnosis, an opening leading into the antrum is made in the following manner:

If a tooth is the cause of the suppuration, an opening into the pulp chamber should be made and the apical opening enlarged by means of a good sized drill. It is, however, more often necessary to extract the tooth. But when neither the extraction of the tooth nor the apical opening is possible or advisable, an opening in the region of the canine fossa should be made, leading into the antrum. The patient is then seated with the head slightly reclining, and the natural opening of the nose (the middle meatus) leading into the antrum is loosely packed with gauze, which readily yields upon slight pressure.

The case is now ready for the injection of the paste. The gradual filling up of the cavity displaces the pus contents, which are forced through the natural opening into the nose. Care must be taken that the entire cavity is completely filled with the paste. The injections are repeated according to the pathological condition and symptoms of each case. But it is advised that from four to five days should intervene between the injections. The extreme end of the syringe tip should always be a trifle larger in circumference than the opening in the antrum through which the injection is made.

From the foregoing description we must not be led to believe that every case of empyema of the antrum will respond to the treatment outlined. In chronic cases, where the mucous membrane lining these non-collapsible cavities or their bony walls becomes necrotic from the persistency of the infection, a cure is not to be expected unless a thorough curettage of every portion of the infected tissue is carried out. The cavity is then packed with borated gauze for 24 hours, after which time the pack is removed and the entire cavity filled with bismuth paste of following formula:

Bismuth subnitrate,	30%
Vaselin,	40%
Paraffin,	20%
Wax,	10%

You will observe that the percentage of paraffin and wax is increased from that of the previous formula given. It is well known that the paraffin is not absorbed and remains in the cavity to act for the building of new tissue, and the bismuth subnitrate stimulates rapid growth of healthy granulations. The ultimate result will be the entire obliteration of the cavity into a solid bony mass.

I wish to mention another class of cases in which the bismuth paste injections have proved of great value, namely, in suppurative cavities of

the jaws caused by phosphorous necrosis, traumatism, syphilis, and tuberculosis.

The same rule should be followed as previously stated that when great masses of necrosed tissue or sequestra are present, surgical interference becomes necessary before a cure can be expected. It is clearly understood that systemic treatment should accompany the local treatment. The use of the paste in recently operated cases, in which spontaneous healing may result in due time is not indicated, but only in those cases where the healing may be protracted and where there is no tendency to spontaneous closure.

It should be remembered that newly-formed drainage channels have very thin walls and may tear upon forcible over-distention with the paste and thus open fresh areas for the occurrence of infection; therefore, it is advisable to use moderate pressure.

Moreover, we must bear in mind that fresh surfaces absorb the metallic bismuth much quicker than the hard fibrous walls of chronic sinuses, and thus the excessive absorption may lead to bismuth intoxication. This danger can, however, be safely excluded in the cases that come under the observation of the dentist, and no serious complications need be looked for, since 100 grains of the paste are rarely used in dental cases. In larger quantities the symptoms of bismuth poisoning are ulcerative stomatitis, with bluish-black borders around the gingival mucous membrane.

#### PYORRHEA ALVEOLARIS.

While much has been said and written upon the etiology and pathology of pyorrhea alveolaris, the fact still remains that there is a large element of doubt in the minds of the most optimistic as to the subject having been exhausted along this line of investigation. At present we are still unable to state whether it is a local disease, due to a local disturbance, or the result of a systemic disorder or both.

I shall not attempt to review the literature, but simply state that while the advocates, who believe pyorrhea alveolaris is a local disease, are very numerous, those who advance the systemic hypothesis as being the primary cause give a more plausible explanation, and give additional strength to their claim by clinical observation with corroborative tests.

It has been my experience as well as that of other men, that in patients troubled with constitutional disorders, as those that cause faulty elimination, toxins, etc., the pyorrhea does not respond to any kind of local treatment permanently unless the systemic ailment disappears or is materially improved. Therefore, I am inclined to accept the latter view, obtain a history and where the constitutional trouble is incurable, the treatment will be only palliative and not permanent. From my clinical experience and reports from other sources, I am constrained to state that in order to obtain results from bismuth paste treatment, the cases must be selected and, as already intimated, where the pyorrhea accompanies one

of the attributable constitutional disorders, a cure cannot be looked for unless the systemic treatment precedes the local treatment, or is concurrent with it. When the pyorrhea is due to a local cause, such as deposits along the roots of the tooth, the most gratifying results are obtained from the use of bismuth paste.

#### THE TREATMENT.

The blunt-pointed end of a flexible silver needle, attached to a metal syringe, charged with bismuth paste, is inserted into the deepest part of a pus pocket, and by gentle and steady pressure the paste is forced into all parts of the pus pocket. At the subsequent treatment deposits as well as all substances causing the destruction of the tissue are thoroughly removed, and again the paste is injected as before. This process is continued until the discharge ceases. I do not disturb the deposits at the first treatment, and this is done intentionally, because the sealing may produce laceration of the soft tissues and further infection of the adjoining tissues may occur. The injection of the paste, due to its bactericidal action, when in contact with infected tissues for some time will place them in a favorable condition for the removal of deposits. All hopeless teeth should be extracted, as their protracted retention will act as a barrier to a cure. The ligation and fixation of loose teeth is strongly advised.

#### FREQUENCY OF INJECTIONS.

The number and frequency of injections are determined by the response to treatment in each individual case. If, after the first injection, the character of the discharge changes to a serous or sero-purulent consistency, it is best to wait from three to four days before repeating the injections. In exceptional cases the pus discharge will entirely cease after the second injection and the case remain cured, but as a rule it requires from 5 to 15 injections to produce good results. The combination of bismuth subnitrate and vaselin forms an excellent means of treating pyorrhea alveolaris. As the bismuth is insoluble, it is not dissolved by the saliva, and the vaselin, being a semi-solid vehicle, keeps the bismuth in contact with the diseased tissues long enough to produce a curative effect. For the above reasons, the injection of bismuth paste is preferable to any of the watery fluids, frequently used. Whether corrosive or mild, no matter how effective their bactericidal action, they can be of only temporary benefit, because the solution will not reach all parts of the infected tract, and if it does will not remain in contact with the infected walls sufficiently long to exert a therapeutic action.

The curative property of bismuth paste in all chronic suppurations has by this time been fully tested in thousands of surgical cases, and it has been proven by laboratory investigations that the contact of the paste with the infected tissue causes a gradual diminution and final disappearance



of micro-organisms in the discharge and in most instances the complete cessation and obliteration of the suppurative cavities and sinuses.

In answer to the questions, what becomes of the bismuth paste when injected, what is its mode of action, and what is its therapeutic effect, the following theories have been advanced:

Dr. Emil G. Beck in his textbook states that some of the paste will escape from the sinus or cavity after some time, and that which is retained will be slowly absorbed and slowly eliminated. This can easily be demonstrated by means of tracing with radiographs and by experiments on animals. He further states that the bismuth paste, when introduced into infected channels, produces chemotaxis; thus the leucocytes invade the suppurative field and destroy all micro-organisms present; also, that the mechanical distention of the infected cavity, separating the diseased walls, bringing them in contact with a sterile and smooth paste is in itself a condition favorable to healing. A plausible cause for the therapeutic action has been advanced by Dr. Baer of the Johns Hopkins University, who concluded after experiments that the free nitric acid liberated from the subnitrate of bismuth by hydrolysis from the heat of the body is a factor responsible for the effective healing.

This question is still open. The clinical fact, however, remains that the introduction of the paste in chronic suppurative cavities checks the growth of micro-organisms and produces rapid healing.

In my last report on this subject I gave the statistics collected from about thirty dentists in this country and from the favorable reports I have received since from other sources. I am convinced that the paste has a permanent place in the diagnosis and treatment in suppurations of dental diseases.

#### DISCUSSION

DR. H. E. FRIESELL: While my experience with bismuth paste has not been great enough to justify speaking with authority as can the essayist, it has been sufficiently extensive to enable me to appreciate its value in certain conditions. I have had no direct experience with it in combination with the X-ray, but our worthy president, Dr. Biddle, has had considerable, and from some of the work he has shown it seems to be an ideal means of tracing out and locating obscure abscess tracts, especially those that are subperiosteal in character, which are so difficult to follow by any other means and which are too dangerous to overlook or neglect. It is also a great help in tracing the extent of a pyorrhea pocket, or the area of periodontal penetration in phagedenic pericementitis.

I have not had occasion to use the paste in the few cases of antrum involvement I have treated since Dr. Beck introduced the bismuth subnitrate; but should have used it had the cases not responded otherwise to very simple treatment. Of course, as the essayist has said, it is unreasonable to expect the paste to cure a case of antral empyema, complicated by necrotic or carious bone or polypi, without first removing said complications. We must not expect this or any other drug to overcome conditions that properly require surgical or mechanical procedure. The paste is only expected to simplify and hasten the healing process by stimulating cell reaction and preventing reinfection to a large extent.

The use in the antrum of the preparation containing the 20 per cent paraffine I would not care to practice if, as Dr. Beck says, it tends to bring about the entire

obliteration of the cavity by a solid bony mass. I would expect this condition to dull the sense of hearing to some extent and to interfere with the resonance of the voice. The softer preparation would, I think, be equally serviceable in curing the empyema and leave the sinus as Nature intends it to be.

In pyorrhea treatment Dr. Beck's method of injecting the pockets with the paste and allowing it to remain there a day or two prior to operating is good surgery, as it is in the line of sterilizing the field of operation previous to operating and undoubtedly prevents to a considerable extent the intense inflammation that commonly follows radical scaling in pyorrhea. I believe, however, that if the pocket be washed out with tri-chloroacetic or phenolsulfonic acid, the same end will be gained in one less sitting.

The micro-organism, or organisms which cause the pus—for we are not yet certain whether the *B. fusiformis* and the spirillum are two different micro-organisms or simply different stages in the development of one form—evidently become pathogenic only in anærobic conditions, and if the pyorrhea pockets can be kept filled with the paste they would be prevented from entering, and this complication would be removed. Proper care, then, devoted to removing the constitutional condition should result in a cure where there still remained sufficient alveolar process and periodontal membrane to support the teeth.

The most satisfactory results I have had in the use of the paste have been in connection with chronic sinuses from dento alveolar abscesses, where I consider it superior to any gauze for packing purposes, as it requires less attention and protects better against the ingress of bacteria.

An interesting case of bismuth poisoning that came into my hands recently very clearly demonstrates that the paste is absorbed and also that the glands of the periodontal membrane and gingiva eliminate certain things from the body as the violet-colored gum line indicated.

## THE TEETH AS AN IMPORTANT FACTOR IN PATHOGENESIS\*

By H. A. Potts, D.D.S., M.D., Chicago

**M**Y OBJECT is to call the attention of physicians and dentists alike to the importance of further study and preparation for work in a field which has no hard and fast boundaries, but which is widely overlapped by both medicine and dentistry. Because of the diverse relations of medicine to dentistry and dentistry to medicine it is important that the dentist be versed in general medicine; also that the physician be conversant with more of the general conditions which make up the specialty called dentistry, which has been known as a profession apart from and unconnected with medicine. It is necessary that the practitioner, whether he be dentist or physician, should understand the etiology and pathology as it pertains to the case in hand, a living pathology, as it were. Only this condition permits of the practice of logical therapeutics.

The teeth, during the entire life of the individual, play an important role, both directly and indirectly, in the maintenance of health and in the production of disease, and any deviation from the physiologic may give rise to pathologic conditions affecting the general economy.

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\*Read in the Section on Stomatology, of the American Medical Association, of which the DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Jour. Amer. Med. Asso.*

The chief functions of the teeth are, first, mastication of food in order that the digestive juices may properly effect the changes necessary to absorption and assimilation; second, molding and maintenance of facial contour.

Pathologic conditions, due directly or indirectly to the teeth, occur before the eruption of the temporary teeth, during their eruption and after eruption, and also during their loss, in giving place to the erupting permanent teeth. The immediate pathologic condition caused by unerupted temporary teeth are very few, but the remains of the primary tooth germ may give rise to cyst formation before the development of the follicles of the permanent teeth. Congenital epulis has been observed, the microscopic examination showing the tumor to be of dental origin. The diseases, the cause of which has been attributed to the eruption of the temporary teeth, are legion, but their number is being steadily reduced by the scientific work of skilled pediatricians. There are, however, some conditions which may be traced directly to difficult dentition and others in which it occurs as a coincidence. Nevertheless, the erupting teeth do modify the course of the disease, rendering the primary condition much more difficult to cope with. The chief danger lies in the fact that, because the child is "teething," no further search is made for pathologic conditions which may exist in the brain, kidneys, gastro-intestinal tract, lungs, etc. Without doubt, difficult dentition gives rise to reflex symptoms, some of which may become alarming, especially in undernourished or rachitic children.

The fully erupted temporary teeth are subject to the same conditions as those which affect the permanent teeth, and give rise to a long chain of pathologic conditions. Normal teeth, with live pulps, rarely give rise to symptoms referable to the pulps themselves, but when caries attack them the pulps are irritated by chemicals, sweets, changes of temperature and pressure from the food substances, with resulting toothache, which may cause reflex earache. Many a child has spent a sleepless night on account of an irritated tooth-pulp. As the result of carious teeth and exposed pulps the child becomes ill-nourished, because he will not masticate his food, thereby laying the foundation for gastro-intestinal trouble in the future.

Of more importance is the retention within carious cavities of decomposing foodstuffs, and bacteria which are not of the disease-producing types, namely, bacteria of putrefaction. The final products of such bacterial activity are absorbed by the buccal and pharyngeal mucous membranes, as well as swallowed, and the dire results are seen in gastro-intestinal disease, malnutrition and lack of physical and mental growth.

Cervical and general lymphadenopathy are undoubtedly due many times to absorption of toxins, which may be found anywhere within the body. Not only do carious cavities harbor non-pathogenic bacteria, but pathogenic ones as well, and from this depot they are disseminated, gaining entrance into the organism through the apices of the roots, abraded mucous membranes, tonsils, gastro-intestinal tract and lungs. Arthritis, affecting



any or all joints of the body, may be caused by infection harbored by the teeth or caused by pathologic diseases of the teeth.

The blind abscess, or carious process affecting the bone at the apices of the roots, or the chronic one with a fistula, or pyorrhea, is not benign, even though the patient suffers little from it, because a complete or partial ankylosis of any joint, especially the larger ones, may result from it.

There are many complications and sequelæ following the death of a tooth-pulp. Foremost is the formation of an alveolar abscess, which is essentially an osteomyelitis, and which requires exactly the same surgical treatment as osteomyelitis in other parts of the body. Alveolar abscess without death of the pulp is extremely rare, although at times root abscesses are seen. Alveolar abscesses may be acute or chronic. With the acute form we have pain, swelling, more or less trismus, with cervical adenitis, which may or may not go on to suppuration. After the pus has broken through the periosteum it burrows in the direction of least resistance and may make its appearance anywhere on the lower part of the face, or neck, and at times at the clavicle. Not infrequently a secondary infection with streptococcus gives the clinical picture of a Ludwig's angina. If the periosteum of the jaw is elevated from the bone for a sufficient length of time, necrosis, with loss even of the whole jaw, results.

Without doubt the extraction of a tooth which gives rise to an alveolar abscess is at times contraindicated, and extraction only intensifies the result of the infection. The reason is given by the conditions requiring surgical interference which exist in other parts of the body, namely, abscess formation which cannot be aborted. By that is meant that the infection may be overcome by the vital forces of the body in destroying the bacteria and rendering their poisonous properties inactive; but that when this cannot be done the indications are that the source of infection be eradicated and drainage established. Very little absorption takes place without pressure. If in the effort to eradicate the source and establish drainage, the operation is improperly done, the process continues and is more wide-spread because of the traumatism to the parts. This is what happens when a tooth is extracted at the height of infection and before the formation of pus. The source of infection may be removed, but drainage is not facilitated, and the traumatized tissues are more susceptible. After the formation of pus, extraction facilitates drainage through the socket because of the destruction of tissue at the apex, and this cavity communicates with the socket.

The chronic form of abscess may result from an acute one, or it may never exhibit acute symptoms. Either the organisms have become attenuated or are of the very mild type. The process ends in a fistula, which may open within the mouth or on the surface. Chronic intoxication, with anemia, gastro-intestinal disturbances and chronic cervical adenitis or rheumatism, may result. This condition continues until the source of infection is eradicated.

After the crowns of temporary teeth have been destroyed by caries the roots form receptacles for retention of putrefactive substances. Their rough surfaces often abrade the tongue and soft parts, thereby causing infection atriæ, not only for the pus cocci, but for tuberculosis and other infective granulomata as well. Microscopic examinations of the tongues and mouths of cattle frequently show abrasions, especially at the base of the tongue, which contain the ray fungus. Normally the temporary teeth retain their live pulps until they are replaced by permanent ones. The roots of temporary teeth whose pulps have died are not as readily absorbed, and such unabsorbed teeth deflect the permanent teeth from their normal course, with the resulting irregularity which is so disastrous. Not only should the pulps of temporary teeth be kept alive, but the crowns should be retained. If caries occur the normal contour of the crown should be restored. Otherwise, when the permanent teeth make their appearance, the arch is so contracted that there is no room for them, and the result is irregularity and malocclusion, with perverted facial contour, high or saddle arches, with coexisting adenoids, mouth-breathing, lack of mental and physical development. The loss of temporary teeth, whether from caries or by extraction by the ignorant or unscrupulous, results most certainly in the foregoing conditions. So much for the temporary teeth.

Much which has been said regarding the temporary teeth applies as well to the permanent teeth, but there are other conditions which should be recognized by physicians and dentists as having their origin in the permanent teeth. Before eruption the teeth give rise to cysts and tumors, the part of the tooth from which it springs determining the character of the growth. Follicular cysts may contain any or all of the anatomic parts of the teeth. Follicular cysts usually make their appearance between the twelfth and the sixteenth years, corresponding to the tooth development, although they may occur in infancy, having developed from the follicles of the temporary teeth, or, later in life, not infrequently from the third molar. The most frequently occurring cysts of the jaws are the root cysts. These develop from the granulomata at the ends of the roots, whose pulps have been destroyed through caries and exposures. The cystic formation is due to epithelial development, which is stimulated by the chronic infection about the apices of such roots, the epithelial development having its origin in the remains of the epithelium which dips down from the mucous membrane of the gums to form the tooth germs, the epithelial debris of the French. It is these cysts, usually of slow growth and without symptoms, which, by pressure-atrophy of the bone, advance and encroach on the facial sinuses and on the nasal fossæ, even occurring in the roof of the mouth or filling out the maxillary sinus, and known as hydrops of the antrum of Highmore. At times pressure or nerve-trunks causes neuralgia, but this is rare, neuralgia being caused more frequently from hard growths. They never contain tooth elements.

Multilocular cysts and the benign solid epitheliomata belong in the same class, the multilocular form springing from the enamel organ, the

others being a development of one or all of the individual elements of the tooth follicle. They present the following forms: embryoplastic, odontoplastic, coronary, radicular, compound and heteroplastic odontomata. Further, we have, at times, hard tumors of the tooth substance which are attached to the other teeth. All of these cysts and tumors produce symptoms and signs relative to the site of their development and interference with normal function. But aside from these, any of them may become infected. In such a case it may be difficult to arrive at an exact diagnosis, which is the key to surgical relief. Non-erupted teeth may or may not give rise to symptoms referable to local conditions or to remote parts. Not infrequently fully formed teeth lie in cystic cavities whose whole walls are of connective tissue instead of epithelium. They may occur near the normal arch or in parts somewhat remote, as entirely within the antrum of Highmore, or high up within the ramus, or they may be projected through the mandible. When near the arch the roots of other teeth are frequently eroded and their vessels and nerves encroached on, causing neuralgic pains. Often the larger nerve-trunks are pressed on by them, giving rise to severe neuralgia.

Non-erupted teeth cause other troubles the importance of which cannot be overestimated, namely, reflex disturbances referable to almost any of the cranial nerves, also taking in a much wider scope, namely, that of impaired mental conditions. Given a patient of a neurotic family, with poorly balanced nervous mechanism, having epilepsy, chorea, habit spasm, etc., it is plain that irritation, even of a mild but continuous character, will exaggerate the symptoms of the primary trouble. Further, the irritation of unerupted or impacted teeth at the changes in the cycle of life will produce more of an effect on the organism than when no great changes are taking place. Upson, of Cleveland, has recently made a study of fifty-eight cases, including manic-depressive insanity, dementia praecox, psychosis, insomnia and neurasthenia, thirty of the patients having impacted teeth. Forty-two patients were operated on: fourteen recovered; seven are convalescent; twelve improved; three unimproved; six, no data. This work opens up a rich field for research and promises great benefit to the sadly afflicted patients. I might add, in this connection, that my experience in operating on insane patients at the Illinois Central Hospital for the Insane, especially those who had been insane for a long time, seems to warrant a belief that any operation on them results in a temporary brightening of their mental faculties.

Sapremia, as the term is used in surgery, is the absorption of poisonous products from bacteria in wounds of the body. It matters not how these poisons are absorbed, whether from a wound, by the mucous membrane of the mouth, or alimentary canal. The bacteria of putrefaction act on nitrogenous substances which lodge in tooth cavities, and their toxins are liberated in the mouth and are either absorbed or swallowed. Thus the patient is a victim of slow ptomaine poisoning, or, if you please, leucomaine poisoning.



Of the myriads of bacteria found in the mouth, only a few can be said to be indigenous. Professor Black has reduced their number to about fifteen different varieties, all practically non-pathogenic. All others have been introduced with food and drink or have been aspirated and, as a rule, are not long retained within the mouth. This speaks for the practicability of prophylaxis and cleanliness. The colon bacillus, paratyphoid, *Micrococcus lancolatus*, with the putrefactive bacteria, are productive of most of the toxins which are injurious to the organism. The pathogenic bacteria are also retained in an unclean and carious mouth and are a constant source of danger.

Atrophy of the teeth occurring in the central incisors, in which there is a lack of development of the middle lobe and a closing in of the other lobes, possibly an effort of Nature to fill in the space, was first pointed out by Hutchinson, of London, but he unfortunately ascribed the cause to congenital syphilis alone. This theory was taken up by clinicians and medical writers and has been handed down in one text-book after another until it has become so rooted in medicine as to be well-nigh impossible of change. Congenital syphilis may be the cause of Hutchinson's teeth, but it is not the sole cause, as they may be caused by any condition which seriously impairs metabolism at the time when this part of the tooth is in the process of calcification.

Normally shaped teeth appearing normally in a normal arch, unaffected by caries, give rise to no pathologic conditions. When they are affected by caries they give rise to the same conditions as described under caries of the temporary teeth. Malocclusion gives rise to many deplorable conditions which could have been avoided had the mouth been in the care of a competent dentist, especially at the time of eruption of the sixth-year molars. The cusps of these four teeth when in proper relation with each other retain the jaws in normal relation with each other, being re-enforced by the other teeth as they appear. But when these cusps are not in proper relation with each other, malposition and malocclusion are exaggerated as time goes on, with resulting prognathism, agnathism and faulty facial contour due to lack of development of the bones of the face and nose. These teeth, coming in before the child has lost any of the temporary teeth, are often mistaken for temporary teeth and, through deplorable ignorance, are allowed to be destroyed by caries, the popular opinion being that they are temporary teeth and will soon be lost, and there is no necessity for having them filled.

Malocclusion interferes with normal function of the teeth, and when that function is interfered with, the teeth, the interdental spaces, periodontal membranes and all the tissues, hard and soft, in relation with them, become a prey to pathologic processes, namely, caries, loss of contact with impaction of food, pyorrhea alveolaris, calcareous deposits, recession of the gums, and absorption of the alveolar septum.

Impaction and complications following occur frequently in connection with the third molars below. Above, the third molars are often inclined

outward and backward and, in consequence, the mucous membrane becomes abraded, food is also retained behind such teeth and fermentation or putrefaction follows. Impaction of the third molars may be of various degrees. It may occur entirely beneath the gum, or the tooth may be only slightly wedged behind the largest diameter of the crown anterior to it. When it is entirely beneath the gum, the roots of the second molar are often absorbed and pressure on the pulp causes pain. Even before this the pressure from crowding may cause severe neuralgia or grave reflex disturbances, resulting, as has been seen, even in dementia praecox and psychosis. If the third molar breaks through the mucous membrane during the eruption, being still covered by the gum tissue, infection is prone to occur, with fever, swelling and abscess formation, which may discharge either in the mouth or on the neck and become chronic. If the pus be not retained the condition may be entirely local and the suppurating condition may exist indefinitely, being a continual source of toxemia.

Neuralgia, the ordinary facial type of *tic douloureux*, is at times caused by pathologic conditions of the teeth. Focal calcification of the pulps, at times, gives rise to neuralgic pains.

While the etiology of carcinoma is still in the dark, it is certain that carcinomata do develop on the tongue and mucous membrane of the mouth at the site of abrasions and traumatism due to sharp teeth or roots.

Tuberculosis can be implanted on an abraded mucous membrane; hence it is imperative that the mucous membrane of the mouth and lips be kept intact. The dentist should be able to cope with any pathologic condition in the mouth, thereby attacking disease many times in its inception, when it is often easy of eradication.

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### THE MAKING OF A RADIOGRAPH\*

By Howard R. Raper, D. D. S., Indianapolis, Ind.

CASE 1. Young man, dental student, aged 21 years. A retained upper left temporary cuspid with no evidences of the presence of the succedaneous cuspid.

The radiograph (Fig. 1) shows the permanent cuspid to be present in the jaw bone. It shows, also, that the root of the temporary cuspid is not badly resorbed, as is usually the condition in such cases.

The impacted cuspid was causing no nerve trouble, and the appearance of the temporary tooth in the mouth was not particularly objectionable. Therefore, no immediate operation was advised.

CASE 2. About two and a half months previous to the time when *figure two* was taken, the patient had presented for treatment of a chronic alveolar abscess of the upper left, central incisor. Radiographic examina-

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\*Given before the Indiana State Dental Society.

tion at this time showed a much absorbed, badly roughened root and a great quantity of cement and gutta percha forced through the apical foramen. An opening was made through the labial alveolar plate and the



cement and gutta percha removed, the root smoothed, the pus cavity curetted and filled with bismuth paste. Though a large cavity still remains in the bone about the root of the diseased central tooth, *figure two* shows, by comparing it with the radiographs taken just after the operation, that there has been some osseous granulation.

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## A METHOD OF MAKING AN OPEN-FACED SHELL CROWN FOR BICUSPIDS

By C. F. Bullock, D.D.S., Geneva, N. Y.

### TECHNIC

This crown is intended for bicuspids which have the labial wall intact.

Build up tooth as usual for crowning. Prepare tooth for band. Secure wire measurement, make band, cut out entire labial portion of band except a narrow neck at the cervical portion. Readjust band to tooth, burnishing well the sides of the band to the tooth. After reinforcing band at the neck, take an impression of cusps, with the band in place, with metalline, pour impression with Mellotte's metal and swage cusp. Solder cusp to band, so fluxing that the labial cusp will contain no solder. Grind lingual cusp now so that the crown will slip on. Burnish margins well to the tooth, remove and flow solder in the labial cusp, then grind down the labial cusp carefully by flowing soft wax in labial cusp and readjusting crown to see where it needs grinding. When the crown is adjusted, remove, polish and cement to place.

This crown will fit properly and will not take more than ten minutes longer to make than the ordinary shell crown and will give a much more pleasing appearance.



## MINERAL STAINS IN CONNECTION WITH JENKINS' PORCELAIN.\*

By J. Melville Thompson, D.D.S., Detroit, Mich.

HAVING WORSHIPPED at the shrine of porcelain for the last ten years and found it, like all ideals, to have its failings, yet its beautiful characteristics, its real worth and value in a practical as well as in an artistic sense have given it a place very near to my heart.

A great many of us take what we hear and see as settled facts, and the writer, with many others, was led to believe that a very low fusing material had no place in a dental practice, and being satisfied with the medium and high fusing bodies, never felt it necessary to experiment with low fusing. Recent experience, however, has caused me to believe that Jenkins' enamel has been more sinned against than sinning, and that it has a place in the field of porcelain.

A few years ago many articles were written, heated discussions followed, and decided opinions were aired upon the question of low fusing vs. high fusing porcelain. It seems hardly necessary at this time, however, to enter into a discussion regarding the relative merits of high fusing and low fusing porcelain.

Volumes have been written upon the theories of the refraction of light, translucency vs. opacity, etc. In spite of all the beautiful theories regarding translucency, the cement problem has not been sufficiently overcome to help us further along in our work. We all know, only too well, how much of our work is rendered at times very unsightly when cemented into place.

About four years ago it was my privilege to spend an afternoon with Dr. N. S. Jenkins in the office of Dr. Van Woert of Brooklyn, and while there came to appreciate the man who put the enamel bearing his name upon the market. It was an added privilege to examine work done by Dr. Van Woert with this material, and it was indeed a great revelation to me. It was not until last fall, however, that I tried it in my own work. Being pressed for time one day, when I was obliged to replace an unsatisfactory Ascher's enamel filling, I decided to try the Jenkins enamel, and was so pleased with the results that many other inlays have been made since, with a large percentage of satisfactory results. I believe a properly made Jenkins porcelain inlay, accurately set with an oxyphosphate of zinc cement, is better than the best Ascher's enamel filling made up to date.

The delicacy of this enamel and the extreme care necessary in its manipulation undoubtedly has been the cause of many failures, and has led many to discard and condemn it as worthless.

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\*Read before the Michigan State Dental Society, 1911.

On the other hand, the high fusing bodies calling for a properly constructed furnace, combined with the failure of nearly every one of them to stand the strain of repeated high temperature, also the expense and uncertainty of maintaining an equipment caused many to abandon the work entirely.

In the use of Jenkins' porcelain one important item which must be given careful and constant attention is the fusing. This part of the work must be done by the eye, and not trusted to timing or the use of the Pyrometer, the temperature approximating 1800 degrees (F). It will fuse in sixty seconds, and the first layer will consume even much shorter time, consequently the only safe method is wise and careful watching. Differing from the high fusing porcelain, the matrix may be made even full at once. When this is placed in the furnace it will be noticed that at first it dries out white, and soon assumes a reddish brown tint, at the same time it will gradually begin to settle in the center. As soon as this change is noticeable, it should be removed at once, cooled, and more porcelain added. About three fusings is sufficient for an ordinary inlay, and although its shrinkage is very marked, it does not warp the matrix. A careful operator can just as beautifully blend colors in this material and build it up to any desired height, just as easily as it can be done with any of the high fusing porcelains. This in the past was a point of argument, which the enthusiastic believer in high fusing said could not be done.

Fearing that I may be misunderstood, I do not wish to be quoted as having given up any of the other porcelains, and will say that Jenkins' enamel has no place in crown work.

In order that we may clearly understand a cause for this paper, a brief explanation of terms used in the manufacture of porcelain will not be out of place. These terms are as follows:

**BODIES, ENAMELS AND FRITS.**—The bodies are the foundation and consist of Kaolin, Feldspar, Silica and Titanium Oxide. Enamels are composed of pure spar alone, or spar colored with portions of the various frits made for the purpose. Frits are composed of Feldspar, Plate Glass and any of the coloring minerals desired, and we find materials such as platinum, cobalt, iron, nickel and gold used as coloring matter.

A little over a year ago Dr. F. E. Roach, in a clinic in Chicago, demonstrated a method of coloring porcelain with high fusing China colors. The utility as well as the artistic value of these colors can be recognized at a glance to those that are interested. To the man in the small town, where large stocks of teeth are inaccessible, they should be of inestimable value, as with these colors ordinary shades may be changed to suit any case.

To any busy man who may fail in his selection of colors, but still have a facing or crown suitable in every way, the time used in making a change can be saved by tinting the tooth at hand. Inlays which are found to be poorly matched in color may be made perfect and the time used in making a second one used for other work.

Recently while using some Jenkins' enamel and not having a bottle of the shade wanted, and knowing that it would be folly to attempt the use of the Lennox colors after the matrix was removed, the experiment of mixing the colors with the enamel was tried and found satisfactory.

In the use of the Lennox colors in connection with Jenkins' enamel, the ochre yellow and the white seemed to give best results. The neutral gray is a hard one to mix successfully, being apt to turn a bright blue when added to the gray. Samples as shown by Dr. Burke and myself will demonstrate the wide range of color possible to a small amount of material.

#### DISCUSSION

GEORGE F. BURKE, Detroit, Mich.: The essayist's reputation as a careful student of matters pertaining to the use of porcelain in our profession is well known to that large body of dentists who have interested themselves in the study of this fascinating subject, and he has described to you today in his paper a scheme for constructing inlays that should receive the attention of all those who desire to improve themselves in this work.

In combining the Jenkins Enamel with the Lennox colors and fusing the same, one finds that there is no perceptible warping of the matrix, which feature has bothered so many in using some of the higher fusing preparations. This feature in itself should commend the use of this method of constructing inlays.

The essayist has failed to emphasize, as he should, the great saving of time that results by the use of this method as compared with other bodies on the market. This fact should also recommend itself to the busy operator.

Still another very fine feature of this method is the characteristic of the inlays to remain the same color after being mounted. The cement fails to cause any change in color when finally finished.

To those who have never taken up the construction of porcelain inlays, it might be said that this method is one worthy of consideration, as the initial expense is small, as it does not require one of the higher priced furnaces, but can be done very nicely with one of the small inexpensive furnaces that are now on the market.

The essayist has not outlined to you the class of cavities that are best suited for filling with porcelain inlay. He has left that for you to decide, and doubtless there is much difference of opinion among you on this subject. If one desires to work along conservative lines, however, their use should in the main be confined to labial and proximal cavities.

When large proximal cavities appear in any of the incisor teeth, involving from one-third to two-thirds of the incisal edge, experience has taught me that an operator can secure not only the most esthetic results but the greatest degree of permanency by using the all-porcelain shell crown, which was first given to the profession by Dr. Land, and which undoubtedly is his greatest contribution.

#### SILICATE CEMENTS\*

By Harry Watson, D.D.S., Grand Rapids, Mich.

**T**O COVER so large and valuable a field as that suggested in the subject, Silicate Cements, in a ten-minute paper would not, in my estimation, be doing the matter justice, and inasmuch as my most successful experience has been with Ascher's Artificial Enamel, I will confine my short paper to that material, with a few points on cavity preparation, mixing, etc., giving the results of five years, and suggesting a possibly new and valuable field of usefulness for this material.

\*Read before the Michigan State Dental Society, 1911.



In my own practice, the use of Silicate Cements and gold inlays have so far superseded the use of foil gold and pluggers that in the last two years I can safely say I have averaged no more than four malleted gold fillings a month, and have caused my patients greatly less pain in excavation, shorter sittings, more beautiful esthetic and permanent operations at a less cost of vital energy to myself.

Cavity preparation must be absolutely thorough, every trace of carious or discolored tooth structure removed. Enamel margins should be cut to as near a sharp right angle as possible. Silicate cement is chemically an exact and very sensitive formula and one in which any additions, such as the acids of caries, dried alkaline salts of the saliva, etc., would prevent perfect chemical union of its component parts, causing a speedy dissolution or a slower change in color. This material has comparatively little edge strength, hence the necessity of getting sharp right angles to all cavity margins.

In all deep cavities a thin layer of oxyphosphate should be first applied—I say a thin layer, as a thick one must necessarily destroy the natural translucency of the tooth, as well as the material, while a thin one serves the purpose better. Many pulps have been destroyed by the great pressure necessary in packing Silicate Cements into deep-seated cavities and not through any traces of arsenious acid or other toxic drugs in its composition. After the layer of cement is in place and slight undercuts obtained, the cavity and intact approximal enamel surfaces should be washed and dried with absolute alcohol.

The proper shade should, of course, be determined while the tooth is still wet, by use of the porcelain shade-guide, which is fairly accurate, or by trial mixes. Follow absolutely the directions furnished by the manufacturers. Use a mixing slab for this work alone and no other. With a thin bone spatula, also scrupulously clean, place a quantity of the powder equal to about twice that of the liquid on the slab and carry half the powder into the liquid, mix with a light rapid motion, add small quantities of powder only when the liquid has taken up all of the previous addition of powder. Deftly and expeditiously continue without spreading the mix or scraping the slab more than necessary until it becomes thick and stiff without showing any white grains of powder. Carry quickly small pellets on bone, tortoise shell or tantalum instruments and pack firmly into all parts of the cavity and condense all margins while material is still soft. A thin celluloid strip held over the filling and burnished toward the margins is sometimes useful. An ideal finish would be one in which there was exactly enough material to fill the cavity with no excess at the margins, but I have never yet been able to judge the exact quantity to obtain this result. After the filling has hardened about fifteen minutes, with sharp instruments trim the margins and use strips and disks coated with vaseline and a beautiful finish can be obtained. Wash the filling with alcohol and apply paraffin wax. After twenty or thirty minutes remove the rubber dam carefully so as not to displace the wax.

A year and a half ago a case presented in which large mesial caries in upper centrals extended so far under the cervical gum margin that I found it impossible to apply the rubber dam with absolute certainty of dryness to insert Ascher's enamel. The portions of the cavities under the gum were prepared and filled with alloy, and at a subsequent appointment the dam was easily applied and enamel placed in direct contact with this amalgam to fill the conspicuous portion of the cavities. This case was inspected a month ago and after one and one-half years of service there is no discoloration. From this and other experiments I believe simple contact of metals does not necessarily discolor Ascher's enamel, but I do believe that the burnishing or spatulation with metal instruments causes a grinding away of the steel instrument from the contact of the rough powder of all silicate cements, and these ferric salts alter the chemical combination, causing dissolution or discoloration.

For the dentist who cannot use an electrical furnace, Ascher's enamel offers possibilities of great value. In the making of jacket porcelain crowns, I beg to submit briefly the technique of a method of substituting enamel for fused porcelain in the making of this, one of the most beautiful and esthetic creations of modern dentistry. The root is prepared as for the Spaulding crown and a Davis crown selected. With a suitable tray made of metal tubing an accurate impression is taken of the root end in dental-lac. After allowing this to harden in the mouth without removing it, a bite and compound or plaster impression is taken. Fill the first impression of root with oxyphosphate cement and when thoroughly hardened pour remainder of impression with plaster. Separate, place on articulator with bite. With suitable small carborundum stone, enlarge pin opening in Davis crown until same can be fitted over cement model of root. Make a slight undercut in crown to insure attachment of enamel. Rub cement root end with soap stone, mix enamel and set crown. Allow plenty of time for hardening, remove and polish. Roughen inside of crown for attachment of cement and set in mouth.

A jacket crown made in this way is, I claim: first, stronger; second, can be made to fit more accurately; third, consumes less time in making; fourth, is made in the laboratory.

I have three crowns that were put in one year ago and are in perfect condition today.

#### DISCUSSION

DR. C. LEE BLISS, Detroit: When in the year of 1907 I began the use of Ascher's Artificial Enamel it was with more or less misgiving as to its permanency and shades obtainable, but with a desire to accomplish more pleasing results from an esthetic standpoint. Also to help eliminate the pain experienced in thorough gold foil work. I wish to call your attention especially to the word *thorough*. A great many of you here fully realize the partial reason for non-success in many of our gold foil operations. We perform the part of a contortionist in attempting to reach the distal portion of a crowded cuspid and then wonder a few months or a few years later why our pain-taking was but a partial success. Again after properly condensing a large filling in a frail lateral or central and being later confronted with an abscessing tooth; we wonder if possibly that same pulp could not have been saved in some other manner less harsh.

The field for such a material is very extensive. Leaving the gold and porcelain inlay out of consideration, Ascher's Artificial Enamel surely had its place among fillings of the difficult and esthetic type. There are in our profession insane operators who are packing gold or enamel in nearly every cavity they prepare. Each filling material should have its place, and this one is seldom indicated on cutting edges or grinding surfaces. I have had experience with it in my own mouth, in a molar, and I must say, "It won't stand the test there."

The essayist, having called your particular attention to cavity preparation and mixing, I wish to further touch on a few points as to *indication shades and insertion* that I have worked out in my own experience.

Ascher's Artificial Enamel is indicated wherever the operator can adjust it more thoroughly than foil gold, namely, in cavities calling for excessive separation; in cavities where there is danger of checking the enamel in malleting; in cavities where, up to that time, there is no gold showing in front teeth; and especially in cavities where we have been replacing cement every year or so for our young patients. The latter is one of the very important fields for this material.

Proper shades are one of the difficult problems with which we have to deal and the wisdom of the operator is put to the test in their selection, especially so in dealing with large fillings that involve the changing hues of tooth structure. I find that one or two and sometimes even three shades darker than the tooth structure give the most pleasing results. Cervical work is difficult to match with any degree of certainty and a happy medium is satisfactory, due to location.

In the insertion of Ascher's, one requires the *trenique* that is more exacting than that of gold work. A sticky mix is difficult to pack properly and denotes lack of powder. Too stiff a mix is even worse and should be discarded for another. There comes just the correct moment for insertion and then it is time to work and work fast.

During the past week I had the pleasure of examining a filling I placed over three years ago and found color and margins good. Failures as to color come from stains left in the cavity or faulty packing—leakage resulting. I have had excellent success with liquid placed in the small SSW glass containers. The cover passes over the neck of the containers and insures a clean liquid in convenient form.

Difference of opinion prevails among operators as to the best method of finishing. Paraffine, vaseline, cocoa butter and oil each find favor. I have used vaseline with success. I find if you have surplus of material and take it down carefully with disks and strips, it will be a beautiful piece of work.

In closing, I wish to say that shorter sittings, results as to tooth resemblance, saving of vitality to our delicate patients and ourselves and opportunity for thoroughness in difficult localities should make this material appeal to all of us and stamp it as one worthy of hard work in mastering *trenique*.

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## CARE OF THE DECIDUOUS TEETH.\*

By I. W. Hutchinson, D.D.S., Parkersburg, West Va.

I WANT TO apologize in regard to this—to those who shall discuss this paper. They have not had very much of an opportunity to see what I have to present to the society. I am sure you will all bear with me in regard to this. It is short and will take only a few minutes.

Gentlemen, who of us at any time would not be interested in a subject of so vital importance?

We have a parent bring to our office the little one, nervous and ill. Parent will state, "We have not slept for so many nights," and will de-

\*Read before the West Virginia State Dental Society, 1911.



mand immediate extraction or treatment—more often extraction—and demand this to be done at once, as the child (or they) must have relief at once. Not realizing the effect it will have on the future life of the child, they demand immediate extraction as a relief.

What shall we do? Must we accede to the demand? No! I say no; by all means try to save the deciduous teeth and assist Nature to take its course. Extraction will cause malocclusion, which is sometimes a deformity of the very worst type, for which we as dentists are responsible unless we can make the matter clear to the parent or guardian—which is usually impossible.

Charts and photographs will help to explain why we should not extract the child's tooth before it shall lose it naturally. I would like to show to this society a specimen, also a photograph, of a temporary left lower second molar. (Specimens distributed.) As you will note, it has between its roots well defined buccal and lingual cusps of an undeveloped bicuspid. Please note, gentlemen, that this little tooth is, or was, developed into a permanent bicuspid. Hence it goes without saying, if this child of four years had been fortunate enough to have retained this temporary molar until it had reached ten or eleven years of age, it would not only have saved sleepless nights but also a permanent bicuspid which, you see, was unfortunately extracted with the temporary molar. This child, you see, is deprived of its temporary molar for six or seven years, as well as a permanent bicuspid for life—a very deplorable case indeed. In this case I simply acceded to the demand of the mother and extracted the tooth, or teeth, as you see.

I say, do the best we can for the little ones; have all the sympathy possible. Give not only kind words and sympathy, but handle them in the kindest manner possible. Not only instruct the parents in the manner of keeping the teeth clean, but impress upon them the fact that thorough mastication is absolutely necessary, and this is not possible with decayed or sore teeth, as in either case they bolt their food, and thus the little stomachs must do the work the teeth should and ought to do.

My experience has been that I do not enter heartily into the diagnosis of a case when a small child is presented for treatment. They are not as easily approached, since they do not come of their own free will. Hence, it is nearly impossible to give the desired relief, from a professional point of view. It requires tact, and more tact, to be able to handle, with success, the small child. It is amazing how quickly children will distinguish between the false and the true; hence the necessity of ever being truthful. Never deceive. Always make practical demonstrations of the benefits derived from services rendered at first sitting. Polish the teeth, or something that will not hurt in the least; or do something that will give them complete confidence.

#### DISCUSSION

DR. C. H. SKAGGS, Hinton: I had no notice of this—I knew nothing of it until three days ago, and had no time for framing any remarks; but this being a subject in which we all have had experience, we ought to be able to say something along these lines.

I congratulate Dr. Hutchinson on the excellent paper read, and would like to emphasize one or two things regarding the care of the deciduous teeth. One thing I wish to speak of is the eruption of deciduous teeth. The first operation the dentist is called upon to perform for the deciduous teeth is lancing the gums as an aid to the eruption of those teeth. This is not necessary normally, but only in pathological conditions. The question there is a very important thing, to be able to distinguish between normal and pathological conditions. I think that all children suffer to some extent in eruption. I have been married about two years and have a 14-months-old boy that has given me quite a lot to think about in the way of the teeth, and I have lanced his gums quite a number of times and it seems to have given him some relief. It is not necessary to lance the gums in a normal case; only in pathological cases, although the gum tissue in its normal condition, when inflamed, is exceedingly tender. The principal source of pain is not in the tissue overlying it, but when the tooth is bound down by tendons above it, it gives pain which, in many cases, may be so excessive as to cause disorders of an alarming character. Dr. Hutchinson looks to me like a married man and he probably has had considerable experience, and I should like to ask him (as I think he has some children) what he thinks of massage in these cases, and what he has done in the way of lancing gums for the relief of children in dentition.

To emphasize the importance of the care of deciduous teeth, I would like to give three reasons: First, to prevent children suffering pain; second, to allow proper mastication of food (this latter is of extreme importance); and, third, to allow for the development of the permanent teeth.

Probably in apology for this rather hastily prepared discussion I should say that it is just some notes that I made after receiving the program with this discussion mentioned. This is not intended as a discussion, not having had the time for the purpose of preparation, but simply bringing it in as particulars that I should like to emphasize. I agree with Dr. Hutchinson that it is a matter of vital importance and one we should all think about.

DR. O. W. BURDATS, Wheeling: Mr. President and Gentlemen: Unfortunately I did not look at the program at home before coming up here, and I did not know that I was on till I landed in Clarksburg. Then I happened to run it over and saw I was down for a discussion. If I had been here last night and could have gotten hold of Dr. Skaggs, perhaps we could have worked up something good—or had access to the paper written by Dr. Hutchinson. However that may be, it is a subject that certainly interests all of us. If I know anything, or am able to judge human nature, Dr. Hutchinson certainly looks to me like a man who would have the patience of Job and who could possibly treat this subject as it should be treated. I certainly must confess that I haven't the patience to worry with children's teeth. I think it is one of the most important stepping stones to a practice-builder that we have. If you become acquainted with your children you know your future patients; they grow up under you, and I think right here is the place for oral hygiene. If we could prevent the deciduous teeth from decaying we certainly would educate our young patients to have less fear of the dentist. I believe that if it were possible for any practitioner to build up his practice so that he could in these cases use the dental floss and overcome their fear it would be a good thing. A great deal was spoken of about this at the National convention, and a great many dentists are instituting a separate branch in their practice whereby they use the dental floss. I believe a woman would have more patience to work with the children. I know that during your busiest hours of the day, probably all of your time taken up, along comes a little child suffering pain, and probably you are not in the best of temper; you have probably been annoyed by some case you have had; and here comes a little child, and you are unable to treat the children with all the patience possible. They are suffering; they are afraid of you, and I believe if we could give more attention to the deciduous teeth we would have much less trouble with the permanent; and, furthermore, the digestive organs of the child would be better

taken care of. We know if children have any pain in masticating food they are going to swallow it whole. Consequently when they are 15 or 16 years old they are suffering from indigestion, and the permanent teeth are suffering from this malnutrition which is brought on from the stomach being out of order. But the question often occurs to me, What is best to do when a child comes in suffering? Parents probably not able to pay for the dental service which should be given the child, and you have to extract a nerve in one of the deciduous teeth—and I am told many dentists treat deciduous teeth that way, but I do not, as a rule, make a practice of it. But if you would run up a bill of \$15, \$20 or \$25 for treating deciduous teeth, I think most parents would think you were robbing them. I would like to know the experience of some of the practitioners in that particular line. I try to treat the deciduous teeth as carefully as I can, but I often extract when I should not do so.

DR. JAMES E. DOWDEN, Fairmont: I have been enjoying myself listening to the discussions. As Dr. Burdats has said, it is a care to treat children's teeth, and I am sorry we do not pay much attention to it. It is also a fact that we do not get prices commensurate with our services in this particular. While we are hardly in the missionary business in that line, sometimes it is well to do a little of it. I had an old lady bring in a child the other day who needed considerable work done, and she said, "You would not charge the same as you would for an old person?" I told her certainly; that it was a great deal more trouble than filling a grown person's teeth. She went away. But I think it is well to pay more attention to this matter. I think the position of the essayist is well taken.

PRESIDENT WALKER: Dr. Hutchinson has given us a most excellent paper on this subject, and we will call on him to close the discussion.

DR. I. W. HUTCHINSON, Parkersburg: Mr. President and Ladies and Gentlemen: I will keep you just a moment. I want to say in reply to Dr. Skaggs saying that I am a married man, that I have a number of children in my home. In regard to massaging, there is no doubt in my mind that massaging is the very thing that we ought to do, and in our instructions to our little patients or the parents (it seems to me that we want to teach the parents), we should speak of this. I have in my office a few charts around my chair, and I try, and my assistant (I have been fortunate in having a very intelligent one) follows my instructions along that line as to how people should care for their teeth, children and parents alike. I make that as a suggestion, that we can do a good deal along that line.

Dr. Burdats said something in regard to being patient with the little ones. I have in mind now a family that, ten or fifteen years ago, had two or three children in the family and they wished to save their teeth; some were temporary. My! I used to wish to the Lord that I would never see those children again; and still the parents were good friends of mine and I loved the little ones or I would have dismissed them at once. But in the last two years they moved to Kansas, and some of their teeth needed attention very much, and they called just recently and I got quite a nice bill out of it. That is just an instance. Some of these small children are my best patients today, and I can just hurt them a thousand times more than when they were small and they will submit to almost anything I would do in regard to filling their teeth.

In regard to what Dr. Dowden said, I can verify that. Some of the small children I have had are now the best patients I have.

**Smile, even if it hurts; bluff it. Any old chump can be a grouch; and you will have accomplished something, if you can always leave them smiling when you say good-bye.**

—John Emery White.



## PRESIDENT'S ADDRESS\*

By Don M. Graham, M.D., D.D.S., Detroit, Mich.

IT AFFORDS me unusual pleasure in addressing the fifty-fifth annual convocation of this society. By a time-honored custom, the presiding officer is expected to inflict you with an address, and no doubt in the early history of dental societies, when most of the work was done by the president and his officers, it was meet that he render an account of this stewardship and make such recommendations as he deemed advisable. Under re-organization, however, to committees are assigned these duties, and no work of professional dental interest is left without its corresponding committee. During the year your committees have met and deliberated and will present to you in due time their recommendations. It would, therefore, be presumptuous for me to go into details of the various departments of our profession making recommendations. All a president can consistently do is to review, in a very cursory way, the needs of the profession and modestly suggest recommendations along general lines.

In the early history of dentistry, naturally, mechanical phases were emphasized. Improvements in materials and technique were elaborated upon. Every energy was bent to the perfecting of the gold filling and the vulcanite plate. Later, attention was directed to crowns and bridges and to continuous gum work. In more recent years the esthetic side of our profession claimed the attention of its members, with the result that porcelain was brought into use. To this was added the gold inlay of today, yet all these constituted one grand system of repair, and it remained for a few latter-day enthusiasts to take up the work of prophylaxis from which so much was expected and not a little realized.

It would appear, therefore, that with such achievements in the past and with such promise for the future, none of its members need be ashamed of his profession, considering its humble origin of fifty years ago. Indeed, no department of the healing art has contributed so much to the alleviation of pain, to the comfort as well as to the personal adornment of the individual. Nor has any other branch of medicine such great promise in the field of prophylaxis as that of dentistry. With such a record to its credit, we can very properly ask ourselves the question, Does dentistry receive the recognition to which it is entitled? Were we to accept the statutes of our commonwealth as the answer, it would appear not. Today a dentist in local option counties is compelled by law to undergo the humiliation of getting a physician's prescription before he can buy alcohol for use in his laboratory, or alcoholic restorative for medicinal purposes in his office. The fact also that the legislature makes no provision for dental services to its wards, speaks volumes for this lack of recognition.

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\*Read before the Michigan State Dental Society, 1911.

Let us enumerate still other evidences which seem to indicate that we as yet do not receive that measure of approval which dental services demand. For instance, very few insurance companies inquire into the oral hygiene of the applicant seeking insurance, and when certificates of illness are demanded it is an unheard-of thing for a dentist's certificate to be accepted for illness of a purely dental nature. In only a few medical colleges is there any instruction on dental subjects, although the value of the same will be conceded by any physician. No lectures are given nurses on oral hygiene, notwithstanding the acknowledged importance of the same. In no hospital in the state is there a dentist on its staff for consultation or active service, no health board, known to the writer, has on its pay roll a dentist, and as yet Congress has not seen fit to grant the dentist equal rank with the physician in military or naval service.

A cultivation of more friendly relations with the physician would help all this and would contribute greatly toward the better understanding of borderland ills, naturally tending to allay unnecessary disputes as to which profession their treatment rightly belonged. The aspersion that we are a profession without text-books and without a literature has some foundation in fact when we realize that the majority of our members have few if any text-books, and that their subscriptions to journals are found to average less than one to every practicing dentist.

We may profitably ask ourselves the question, Who is to blame for all this? The dental profession, in a large measure, undoubtedly is. We cannot expect other professions, nor even the laity, to respect us if we do not appreciate the usefulness and dignity of our own profession. "Those who would be free themselves must strike the blow" is as true today as it was when Byron addressed these words to the disheartened Greeks. In other words, we are not living up to the best that our profession can offer. That our standards of education have been too low in the past goes without saying, that it is now too low is equally true, and we are not keeping pace with our medical brethren in this direction. A gratifying sign of the times, however, is the forward step taken by our State University, whereby both degrees can be gotten by spending five years in college. This voluntary advance is not sufficient, and there is need of a law demanding higher non-professional requirements from all before entering on the practice of dentistry in our state. To this end a committee of the State Society has worked long and arduously on amendments to our present dental law, whereby our state would no longer be made the dumping ground for graduates of low-grade colleges. In short, all candidates for state board examination should be required to have non-professional as well as professional qualifications equal to those of Michigan graduates. An amendment whereby dentists will be placed on the same footing with physicians regarding the local option law was also presented to the legislature and if enacted into law will remove another disability under which members of our profession have been laboring in local option counties.

The question of re-organization is a most vital one to the State Society on account of its members being made up entirely of the membership of the component societies. Whenever a district or component society is allowed to deteriorate, the loss is not only the district's, but it is also a distinct loss to the State Society. Conversely, anything that tends to increase the membership and enhance the usefulness of the District Society is reflected in the State Society. It is therefore advisable and often necessary to give generous assistance to the smaller and newer component bodies, if we are to build up an active and efficient state organization. To these smaller societies our association has always shown a generous attitude in assisting them, and it is earnestly hoped that the incoming administrations will continue this policy. No small difficulty arises from the fact that officers change each year, allowing secretaries, only partially equipped for the work of collecting and reporting, to take up the duties of their predecessors. If component societies, as well as the State Society, could be made to see the wisdom of continuing in office a good secretary from year to year, it would help immensely the growth and efficiency of both state and local bodies. This being often impracticable, the writer suggests that a school of instruction be held once a year at some convenient point where all the secretaries should meet and equip themselves for this important duty. By a free exchange of ideas, and the assistance of those in experience, this work would be greatly facilitated, for under our present reorganization no small share of the success of the society depends upon its secretary.

Briefly, then, the following are a few of the recommendations that suggest themselves to your president:

*First*, the need of amendments to our present dental and local option laws.

*Second*, the persistent but dignified advocacy of measures which will place dental services on a par with other professional services, to the end that we may have equal standing with the physician in federal, state and municipal appointments.

*Third*, the friendship and co-operation of physician and dentist is earnestly recommended.

*Fourth*, a more active and general interest in dental literature is to be encouraged among our members, and they should be induced to see that text-books and dental journals are as essential to a successful practice as an up-to-date office equipment.

*Fifth*, our efforts should be directed to the formation and strengthening of component societies.

*Sixth*, a competent secretary should be continued in office from year to year and a school of instruction should be held once a year at some convenient point where state and local secretaries could meet and equip themselves for the important duties which devolve upon them.

In closing, I wish to take this opportunity of thanking the Fifth District Dental Society for the very kind invitation which permitted us to



meet in this beautiful city of Grand Rapids, and especially do I thank the local committee for their efforts in securing most excellent and mature arrangements. Without further specification, I want to thank all the committees for their most loyal and hearty support in the preparation of the program of this meeting, which we confidently believe will prove the most interesting and profitable ever held in the State of Michigan.

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### THE LEGAL ASPECTS OF DENTISTRY.\*

By Dr. H. H. Harrison, Wheeling, West Va.

**A**LL COUNTRIES and all peoples are controlled and managed by laws emanating from some accepted source. Every individual in every land must be subject to the laws that obtain in the government in which he lives.

In these United States every state may make laws to suit itself, providing they do not conflict with those of the Federal Government. All laws are supposed to be made in the interest of the people who live under them, and are a guide to them in their actions one toward another.

It has been said that the law in any state should be made to suit the financial, social and political condition of the people it governs. This is undoubtedly true in most cases, but if that were universal every state would have about the same laws, and we see quite a difference in many states even where conditions seem to be identical. We know this is true in dental law. In West Virginia we are not as rich or powerful or possibly not so highly educated, among all classes, as the great Empire State of New York, but we need as good dental laws as any state in the union.

We need as good food for the body and mind, and as good medical and dental service as any people in the world; and we mean to have as perfect laws to protect our people from the dental empiric and pretender as can be formulated.

New Jersey may dream of the royal blood of her dental practitioners, but when she wakes up one of these days and looks to the southwest and observes the blue blood of the Virginias she will have to sleep and dream again.

West Virginia has been out of swaddling clothes only about fifty years, but now in her full manhood she is showing her noble birthright in the development of natural wealth, intellectual achievements, and business activity; and with these has also grown richness in professional life that has kept pace with any of the older states. Perhaps no profession has grown more rapidly than has dentistry, nor been more zealous in effort to rise higher in the scale of accomplishments than our profession. But we are still on the push and are anxious to do better things as the years go by;

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\*Read before the West Virginia State Dental Society, 1911.

better things for the people we serve, and nobler things in elevating our profession to the rank and position to which it rightfully belongs.

Dentistry is a specialty of the medical profession and has to do with the health and happiness of the human race; and its practice should be administered by an educated, cultured and honorable class of men. So we must have laws that will measure the ability and control the practice, for unfortunately in all callings and professions there are some who can be held to the upright position only by a guy-wire or cable-tow.

The dental law in most states has many things in common. The dominating feature in all is to secure a high degree of attainment and shut out the montebank whose only aim is mercenary, even though at the risk of the life and health of neighbors and best friends. I think all states provide for a Board of Dental Examiners, who shall stand at the entry-gate to see that none pass or re-pass but such as are qualified by education and training. The wording of these laws may be a little different, but the aim, as before intimated, is to obtain efficiency, honesty, and a high professional character.

I am not expected to formulate any specific law that shall embody all the necessary trimmings—the requirements in particular; but I am simply to start the entering wedge of some of the most important factors and leave you who may discuss the subject to put on the finishing touches.

The most important feature of a dental law must be a board of censors—examiners, who should be men of experience and good judgment, and who shall have discretionary power to conduct the examinations free from bias or mercenary influence.

The board should consist of five members appointed by the governor from a list of ten men selected by the State Dental Society. They shall serve for two and not more than four years consecutively. They shall meet biennially at such place in the state as they may elect, to examine applicants for registration, or any other duty that may demand their attention.

They should be the executive and prosecutor in all infractions of the law.

Their compensation should be eight dollars per day and expenses, and their salary should be paid out of the state school fund, where all the income of the board should go.

They should conduct the examinations in accordance with the law that causes their appointment, but should have discretionary power as a supplement to the law where that power does not conflict with the intent of the law.

They may have other duties devolving upon them that we may mention when we consider some special features not yet considered.

Every dentist shall be registered who may commence practice after this law shall take effect; but those who are already practicing in the state shall pay a fee of one dollar, while all others shall pay twenty-five dollars;

and every dentist shall register every year and pay a fee of one dollar. It shall be the duty of the Board of Examiners to see that this is executed.

The aim of this law is to keep a record of every dentist once a year and to see that he is not degenerating. In this way the profession can be kept free from the dishonorable, mercenary and immoral degenerate. If violations take place and cannot be corrected, the registration may be withheld by the board and the culprit must cease to practice. Lawyers keep their profession free from dishonorable men in this way, and why may we not do the same thing?

When a man presents his application to the Board of Examiners for registration, who has not before been registered in this state, he shall accompany it with a written statement, in his own handwriting, as to his age, place of birth, preliminary education, and the dental college diploma, together with a certificate of character, and pay a preliminary fee of five dollars, the same to be credited upon the fee for registration; this before an examination shall be made. If this preliminary exhibit is not satisfactory to the board the five dollars shall be refunded. But if a further examination shall take place and he shall not satisfy the board of his efficiency, he shall be entitled to a second examination six months hence. The examination may be oral or written, at the election of the board.

There are some very fine and nice points to be considered in casting a dental law that must attract the attention of all dentists, and especially the board of censors. We must recognize the fact that a diploma from a dental college, that belongs to the Faculty Association, represents the highest degree of education and technique that the dental world recognizes; and I am of the opinion, as a dentist and not a lawyer, that any state court would set aside the decision of any state board that would conflict with this conception of the law, providing that there is not conclusive proof of having deceived the college faculty who granted the diploma. We recognize the fact that any state may make its own laws, but these laws must be in harmony with propriety and good sense or they will not stand the tests of the courts.

Some countries prevent the registration of a dental advertiser, and I think the time is near when all states in this grand confederation will limit the character of an advertisement when it misrepresents facts that may deceive the unwary.

Now let me say in conclusion that the great barrier to general reciprocity is due to the unfaithfulness of some dental colleges, who turn out unqualified dentists who impose upon the people, making it a real necessity for every state to protect itself from empirics and montebanks. This condition of things casts a gloom and shadow over the entire dental profession and hampers it in its usefulness and benefits to humanity.

But there is a better day coming, when all these barriers shall have been removed and the dental profession will shine in the galaxy of stars of the first magnitude with a brightness unsurpassed by any other profession.



## DISCUSSION

DR. J. A. LIBBEY, Pittsburgh, Pa.: Mr. President, Ladies and Gentlemen: The only reason they called on me to come down here to open the discussion of this paper of Dr. Harrison's is that I came before the old West Virginia State Society some years ago and read a paper on this subject. I scored some of them pretty severely then, as I may this time.

I have had considerable experience along the line of legislative matters. I have been on the committee in Pennsylvania on the passage of the law of '93 and also '97, the law in existence now. I have had experience on the State Board of Examiners for six years. Had Dr. Harrison had the experience I have had in as large a state as Pennsylvania, with 300 applicants that come before him, there are some things he advocated that I think would never have been in his paper. I hope that Dr. Harrison and I will live to see the last wish of his, in the conclusion of his paper, fulfilled, but I do not expect to see it.

In the first place, Dr. Harrison says that the first thing necessary is that legislation be for the interest of the people. That is one very strong point for the committee in going before the legislature; to give them the impression that we are not working for the benefit of the dentists. But all laws in a state should be for the benefit of the people. Mark you, if you go before the legislature and give them any impression, by your actions or anything else, that we want to be a very select profession by ourselves; that we want to keep just as many out of the profession as possible so our revenue will be increased, I will guarantee you won't get any legislation.

A little instance along that line of my experience in this state of Pennsylvania was when we were before the legislature the time we had our law of '97 passed. Dr. Kirk was chairman of the legislative committee. I was a member of that committee ex-officio, being president of the State Society at that time. Dr. Kirk telegraphed me one morning that our bill had been reported unfavorably by the judiciary general committee. "Come to Harrisburg tomorrow evening; I have asked for a re-hearing." I went to Harrisburg. There were three or four from Philadelphia and one or two others scattered over the state met there with the committee. There were four of us assigned to talk along a different line to the committee, giving our reasons for wanting the act passed. One reason I gave was—the first thing to impress upon their minds was that we were looking to the benefit of the people; we wanted the people to receive better professional services. We wanted to insure them that by having an act passed requiring practitioners to have a competent education. I said, "Gentlemen, the majority of you are attorneys (the majority of *all* our legislators are attorneys). You in your profession require, in the first place, an examination of the student for matriculating. That examination is made by the attorneys. Then you require another examination for admission to the bar. Why? So no man only thus competent to enter the profession can be admitted. That is all the argument I have. That is just what we want." And the arguments along that line were sufficient so that in only about a five-minute session after we were asked to retire they came out and told us that they were unanimous in changing their minds and reporting favorably on our bill; and we got it passed.

Dr. Harrison seems to think that the members of the board should do an enormous amount of work. They should examine the students; they should have discretionary power. I don't agree with that. I think everything that the members of the board do should be laid down by law, and that they have no discretionary power to go past that. Why? Experience is the best teacher in the world. Present company excepted (we are not personal in a matter of this kind), I consider the first board that was nominated and was appointed by the governor under that law was as fine a board as could have been selected in the state of Pennsylvania, and I consider it an honor that I was in such good company. Prof. Trunan of the University of Pennsylvania was always opposed to state boards. He came out when he was editor of the *International Journal* and criticised them most severely. But he says, "I have not any criticism to make of

the present board of the state of Pennsylvania, but we have not any assurance that our boards will always consist of men such as they are." That made us feel pretty good.

When Governor Stone was made governor of Pennsylvania, when he took the chair, one of the first acts he did was to throw out the board. That was at the time of the fight for United States senator, and succeeded in not having Quay elected that winter; but he used that, with every other appointment that was possible, as bribery to get votes for Quay; and among other appointments he made were three of as low-down advertising men as there were in the state of Pennsylvania for our board. Immediately his attention was called to the fact that that was contrary to the law, and he had to revoke those commissions because our law said that a man must be a member of the State Society and of ten years' practice. Two of these advertisers were not members of the State Society and had not practiced ten years. The other, unfortunately, was a member of the State Society. If his conduct had been looked into and the rules of the society had been enforced he would not have been a member; but, being a member, we couldn't do anything and had to accept him. And just to give you an idea of the class of men—I am giving you this now, because later in my talk I will allude to the matter. We had to accept it; and then he had to reappoint the old members of the board because he couldn't do anything else under the circumstances. But we had that one millstone, and when the first time came around for us to make up our examination papers the first question—when it came to the part assigned to him—the first question that he offered was, "What is anamia?" And the second question he asked was, "What is plathoria?" What he meant was "anemia" and "plethoria." We didn't allow questions like that to go in.

I simply allude to that, because if you are not careful in getting up your act that is the class of men you are likely to get as examiners.

In this matter of power and of salary—the doctor says they should receive eight dollars a day and expenses. He wants these members of the profession to be wonderfully generous, to donate a great deal of time for which they do not receive any recompense. I would like you to show me one who is competent to go on the state board and do all they have to do for eight dollars a day. Does this mean just during the time of examinations?—because that is not all the work of the board; that is the small part of it, conducting the examinations for three days. But if you go over those papers for three weeks, as any man ought to, I think night work on any board ought to be double pay. In the state of Pennsylvania our fee is \$25 for the candidate, and that is divided among the examiners, and there is an appropriation of \$2,000 from the state at each meeting of the legislature, which is once every two years; \$1,000 a year for the expenses of the council, the council consisting of the state treasurer, one or two other of the state officers, the president of the State Board of Health, and the president of the State Dental Society. In other words, all applications go to the Superintendent of Public Instruction. They are allowed \$1,000 for the clerical work of looking after and registering the applications and the registering of all papers, which I will come to later. And even at that, dividing the \$25 fee among the examiners, I do not believe there is one man on that Board of Examiners in Pennsylvania today who is not losing time for his work; he is devoting a good deal of time and hard work for which he is not receiving the recompense that he would if attending to his ordinary practice.

So, gentlemen, I would not advise you to put the examiners down to the small fee of \$8.00 a day for that work. If you have only a few coming up every year it is all right. Dr. Harrison speaks of written and oral examinations at the discretion of the board. Here is a very important matter.

The examinations should be in such shape that they can be investigated at any time to see that the examiners are doing their work fairly and honestly; and I do not know how it would be possible to with oral examinations. Some persons can give a very much better examination orally than written, but these examinations should go on record. In our law it requires examination papers, after we are through with them, be sent to Harrisburg, and they are on record there for five years. Any student that

feels he has not been treated justly before us in his examination has the right to take counsel and go there and demand the papers; take any one competent to assist him in examining the papers to see if he has been fairly treated, and there is a record of everything that the State Board of Examiners of Pennsylvania has done so far as he is concerned. That is the only way that this matter can be done thoroughly, honestly and fairly. The State Board of Examiners then is subject to thorough investigation; but if there is any part of this examination of which you have no record the examiner may ask any questions and mark, according to his judgment, as he pleases, and there is no record of it. For that reason I am in favor of written examinations only, to go on record for a certain length of time.

After this work is done these examiners are expected to take a general interest along this line of work, and we generally try to attend the National Association of Examiners. We work pretty hard there; spend a great deal of time.

He adds another thing, and I do not agree with him—that is, that the examiner should be prosecutor. If you are going to make the examiner prosecutor and everything else he is not going to have time to earn his bread and butter. I do not think he should have anything to do with enforcing law. A special committee from the State Society should have that in charge and do that, for this reason: The State Society wants to see these laws enforced. The other man is a representative, not of the State Society, but of the state. He is an officer of the state appointed by the governor. He has enough work to do, and enough to ask any man to do—this examination work, and do it thoroughly and right—without having to look after and attend to the prosecutions also. If you haven't had the experience of going through this work, try being an examiner and prosecutor too, and you would come to the conclusion that one was plenty for one set of men to attend to.

The conditions in the latter part of Dr. Harrison's paper seem to charge to colleges a lack of thorough instruction. He didn't elaborate very much on that, but I judge he had reference particularly to a great class of students that are matriculated. We, in the state of Pennsylvania, required a few years ago—I have not noticed lately—I think it is three years now, high school, or its equivalent. But there are even ways of getting around that. In fact, I have seen students certify that they had the equivalent of two years' high school who couldn't write legibly. It was evident from the answers to their questions that they had never seen a grammar; their orthography was exceedingly poor, and I doubt if they had even a grammar school education. How did they get a certificate that they had the equivalent of two years high school? I know a certain dean of a college who is quite a politician, and a superintendent of public schools who is quite a politician also, and the result is what one would send there the other would sign, paying no attention or looking it up. I know lots of students they have gained in that way. That is just one way. The trouble is taking in students who have not sufficient education to back up the studies that they should have; and that is what we have to contend with more than anything else—a great many men getting into the practice of a profession that requires as much careful study and as much training as it does for the physician, every particle. Every man should have sufficient training to know about anatomy and physiology, which are the foundation of our profession, as it is the foundation of medicine; and so long as the schools take up that class and pass them through and send them over to the state examiners to find out whether they know enough to practice dentistry or not, so long will the poor examiner, who has as much sympathy, gentlemen, as any other class of men, and want to see the young men get along, have to turn them down. The six years I was on the board we had twenty-three and a fraction per cent of failures. Who is to blame for that? If the colleges gave the training they should do we would not have this trouble; and the time is coming when we shall not have any independent schools; they will belong to universities that have endowment and will give the training they should. And when they do, I believe you younger men will see the day that Dr. Harrison wishes for.

DR. W. E. H. CALDWELL, Wheeling: I think that this paper of Dr. Harrison's is going to bring out what the committee on programs had in mind when we prevailed



upon him to present it; and from the discussion of our friend Dr. Libbey, and his experience with dental legislation in Pennsylvania, and the discussion that is to follow, I do not think that we ought to close with this paper tonight; and, just noticing the "get away" that we had, I think we had better dispense with any further discussion for this evening and let this lay over to some more opportune time when every man is present to have a say on the subject. Everyone has some idea as to what we ought to have in regard to a dental law that should be presented to the next legislature.

What brought this subject up was the fact that during the regular meeting of this present legislature there was a dentist, not a member of the society, who took it upon himself to father a bill and try to slip it through the legislature; and I think it is up to the society to go at this in a very careful manner and to bring out all the topics possible on the subject, so that the legislative committee for the coming year can use their ideas that are advanced to formulate the bill. There are a great many points that Dr. Harrison has brought up that could be discussed in detail to the advantage of everybody; and Dr. Libby has added an invaluable amount of knowledge, and we hope to get a lot from every man. So I do not think it is wise to go into the extensive discussion of this subject this evening. Better let it lie over till we get every member of the State Society here so we can get the opinion of dentists throughout the state. Whatever we decide we want in the bill, we have to take into consideration the wishes of the public and what the dentists wish and also what the political aspect of the law is, what the politicians are going to think. We have to take it up before men who are going to vote, and we find that is one of the highest barriers we will have to cross. At least, Dr. Beerbower and myself found that to be the fact when we got down to Charleston. We found members of the board who did not know, apparently, that there was a law before the legislature until we brought the subject up to them. It simply was a case of trying to slip something over onto the society. I don't want to go into the discussion tonight. I would like to have more of the members of the society present when we bring up the provisions of the bill.

**PRESIDENT WALKER:** Dr. Caldwell knows what he is talking about, and I think his point is well put. What is the sense of the assembled body? Shall we open this for discussion tomorrow afternoon?

**DR. D. C. CLARK, Blacksville:** I am a member of the committee on legislation. We expect to have a meeting in the very near future and formulate some laws to be presented to the legislature; but we expect to present those laws to the society for their ratification or rejection during this meeting, and we would like to have this subject continued until that time and have it discussed fully; then after that we can formulate them in our committee. I think it would be a very good thing to have everybody present at that time and have these laws ratified by the West Virginia State Dental Society as a whole.

**PRESIDENT WALKER:** Do you want to present your draft of the laws before the further discussion of this, and then discuss the paper in connection with them; or do you want this discussion continued at some time previous to your drawing up of the laws?

**DR. D. C. CLARK:** If anybody has anything else to say now let them say it; if not, that they say something after we have made report to the society.

**PRESIDENT WALKER:** What is the sense of the assembly about laying this on the table for the present?

**DR. CALDWELL:** I move that we lay this on the table till tomorrow afternoon, and Dr. Clark's committee has the draft of the bill in shape to present, but that he present it at that time as part of the discussion of Dr. Harrison's paper. The idea of Dr. Harrison's paper is to bring out the best thought in the society for the use of the legis-

lative committee this coming year, so they will have a chance to get it into shape to present to the legislature.

DR. JOHN H. MCCLURE, Wheeling: They will have a chance to get the law ready and present it at the next session of the society. They could bring a full-fledged bill all ready, and have it ratified by the society next time. The political end of this thing has more to do with it than the people.

DR. L. G. BEERBOWER, Terra Alta: I second Dr. Caldwell's motion.

Motion carried.

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## ONE METHOD OF UPLIFTING OUR PROFESSION.

By H. C. Sexton, D.D.S., Shelbyville, Ind.

IT IS NOT unusual these days to see hung up in a conspicuous place the motto, "Don't be a knocker." Ordinarily, I must confess the advice is good, but I protest against its universal adoption. Sometimes me-thinks it is good to knock, even to knock one's own profession, provided it be done openly and to the profession's face. I would not approve of a stab in the dark, but a good swinging smash on the nose may lead to much development in a youth, and our profession, although we have outgrown infancy, is after all but in its green and callow adolescence.

To the charge of being a knocker in the present essay, the writer must plead guilty, but in consideration of the above he hopes to be judged not too harshly. Does not an honest confession, to some extent at least, mitigate a crime?

For a good many years I have been scanning articles in our dental periodicals pertaining to the subject of the education of the dentist, and I have yet to see one which did not, to my mind, miss the most important phase of the whole matter. The writers all seem to be held down by some statute of limitations. They possess myopic eyes that cannot see the beautiful forest in the distance on account of the trees in the immediate foreground, these same trees being the three years spent in the dental college.

Now, a man is by no means educated when he leaves college. He is popularly supposed to be, but like most popular ideas, it is more or less untrue. The word commencement is significant of the fact that he is only at the entering gate. He is callow, unfeathered, as yet nothing. What he has acquired is merely the key to a system by which he may become something, a key which he is supposed to use for the purpose of unlocking the powers of his own brain. Sad to say, the majority takes the means for the end. The key becomes their sole possession for all time. They never unlock the doors of their palace; they never examine the chambers within; they live and they die in the vestibule.

As independent thinkers have on numerous occasions pointed out, there is something about a college education that is belittling to a man. The training is too much after one established method for all with no development of the individuality for any one. This, to a lover of Mill's Essay on

Liberty, is most damning. A man in college accepts the result of too much brain work by others at the terrible expense of his own powers of original thinking. It was of this training in the one established chute—this smothering of the individuality—that Horace Greeley was thinking when he exclaimed, "Of all horned cattle, Good Lord, deliver me from the college graduate!" Some one else has expressed the idea thus, "Those who can, do; those who can't, go to college."

As a matter of common knowledge, a big majority of the great men of the world were not college men. Among Americans the list could be started with the names of Benjamin Franklin, George Washington, Thomas Paine and Abraham Lincoln. These men were not college men, they were something better, they were educated men. They never saw the inside of college in youth, some in fact never even attended common school, yet as thinkers and doers they are outclassed by none. And, moreover, it takes but little insight to recognize the fact that had they been college trained, each would have been ruined for the special work he had to do in the world.

The dental college, as a technical training school, is not as culpable in this respect as is the general classical college, and yet we cannot hold it entirely innocent. The older dentists, upon hearing a dissertation from a young practitioner, can often place him in his proper alma mater without asking any questions. They recognize in the young man not anything belonging to himself but the mere echo of some stronger mind or system under which he has been trained.

Probably this tendency can never be entirely eliminated in educational matters. It might be wrong to try to eliminate it. The harm of it comes only when the student drops all reading and study upon leaving college. Then he ceases to grow, consequently throughout his life he is merely the echo, sounding fainter and fainter with the years, of some man or group of men of the preceding generation, strong men perhaps in their day, but, as is the fate of all mortals, soon left behind in the continuous advance of the world.

And now, in view of the foregoing, when one comes to speak of a professional uplifting, is it not a most grievous error to think it can be accomplished inside the dental college? We must work not so much inside the dental college for three years as inside the man his whole lifetime. The great Americans of whom we have spoken did not accept any arbitrary labels either of inheritance, of college or of society; but throughout their lives they continued in the system they had begun, the system of doing their own reading and their own thinking.

The returns from a farm whereon the owner resides will always exceed the returns earned by a renter. Likewise with the mind. Its cultivation by proxy gives, at the best, but a poor income. Franklin himself recognized this truth when he said, "The best part of any man's education is that part which he gives to himself."



But sad to say, the majority of humans, including college men, never give to themselves any education. When they enter life they accept a label and under the shelter of that label they merely vegetate on their way to their graves. Look about you and see. Is it not true?

The mass of men are Methodists, Presbyterians, Baptists, Catholics, Democrats or Republicans, not because they have ever weighed in their own minds the doctrines and principles these organizations stand for, but because they were born into them. They have complacently accepted the label handed them by their fathers or their families and have had no more to do with their course in life than has the running river with its course. It goes down hill, the easiest way, and so do they.

Whenever I see an ardent and militant member of any of these organizations I have named, I immediately want to know whether his position has been inherited or whether it is really the result of intelligent thought and selection on his own part. If the former, I don't think much of the man as an intellectual force; if the latter, I do. I think more of a Republican born a Democrat, or a Democrat born a Republican, than I do of either Democrat or Republican born such.

But isn't it astonishing to behold the amount of smug satisfaction exhibited by some vegetating labels? As Kipling says, they have "too much ego in their cosmos." Now the ego would not be so bad were it only home grown, but where it is an importation it becomes at times a source of great annoyance to beholders as well as a handicap to the possessor.

The more a man has in himself the less will he want from other people. And after all due acknowledgment of the importance of position and wealth, it must be admitted that real happiness can come only from within. As that land is best off that requires fewest imports, so is that man richest who requires least from outside himself for his own entertainment. Imports are expensive things, expensive in many ways—they reveal dependence, entail danger, and when all is said and done, are poor substitutes for home produce. Similarly with education—let a teacher lead you over Euclid's Bridge of Asses, the Pons Asinorum, and it will make little impression; dig it out for yourself and it is yours to the last minute you draw breath.

There are two great classes of labor, two great species of achievement in this world, and sad to say, each is often prohibitive of the other, not necessarily prohibitive but practically so. The first class is the labor of the hands—all mechanical construction. It is one of the greatest pleasures of existence to see something material grow under your hands into an important work of usefulness and beauty. The dentist is essentially that sort of a worker, and in the intelligent practice of the mechanics of his profession he undoubtedly derives a pleasure that cannot be obtained in purely intellectual work. I do not wish to detract from either the usefulness or the joy of this kind of work, but there is one serious drawback to it as it is practiced by the dental profession today. It is held in such esteem and importance that the second class of achievement is utterly neglected. By

the second class I mean achievement of the purely intellectual sort, the kind into which mechanical work does not enter.

Dentists are often slightly spoken of as "tooth carpenters." As mechanical workers, we are that and nothing more. Unless we develop the intellectual side, unless we become readers, students, thinkers, writers, we are nothing else. And this side of themselves, the dentists of today are not developing as they should. More than one bookseller has made the statement that dentists are not book buyers. And it is true. Dentists as a class do not buy books. Dentists do not even buy, to any extent, the latest books in their own profession, the books dealing with the mechanical problems of practice; and when it comes to books of a higher order, books that mark great intellectual epochs in the growth of mankind, dentists are non-readers and non-buyers.

And thereby we miss one of the greatest pleasures of existence—the pleasure of witnessing our own intellectual growth. We have tied ourselves to mechanics and we find it hard to escape. It is a pitiful situation when a great big body of intelligent men will deny themselves this greater growth simply because one requisite of their profession is that they be good mechanics.

A man may be a good mechanic and at the same time be a scientific reader and thinker, a philosopher, a lover of all good literature and a dweller in the delights of the book-worm. There is nothing incompatible between them. In fact they are mutually helpful; each will relieve the stress and wear of the other and introduce a variety into our lives that will be a wonderful uplift.

Reading and study must be the foundation of all development to higher things. Never mind what you study so long as you study something. From toadstools to angels, the study of any subject means growth, and not only growth in knowledge, but growth to higher things—to wisdom, to better thinking, and to better living.

The essence of intellectual living does not reside in scientific or literary knowledge nor in perfection of expression, but it does reside in a constant preference for higher thoughts over lower thoughts. This preference becomes a habit of mind.

The mind of many a college man is comparable to a garden plot which has been broken and planted, then is allowed to grow up in weeds. Unless followed by constant work, the preliminary planting is mere wasted labor.

The powers given us by Nature, both physical and mental, are but powers to become. Man's intellect, even under constant use, does not arrive at its maximum of force and judgment until middle age or past, if in disuse it is of course never developed. Many of us read of the intellectual powers of some great man with awe and envy. We do not stop to consider what has made that man great—the intense application of years, and of years perhaps when we were intellectually dawdling. Great men do not "just grow" like Topsy. They make themselves, and not inside a college but inside their own craniums.

The biography of Hugh Miller well illustrates this point. Hugh Miller was a common, ignorant laborer in a quarry, a locomotive vegetable, nothing more. One day in blasting a rock he brought to light a most beautiful fossil. To Hugh Miller that fossil came as an intensely fascinating message from the past. It was written in cypher, but he set his jaws in a bull-dog way and determined to devote his whole life, if necessary, to the deciphering of it. How did the body of an animal get into the middle of that hard rock? He procured books and began to read—with reading came thought; he began to grow. Ere long he had left the vegetable existence far behind. In the end he became one of the world's great geologists and his charming book, "Old Red Sandstone," will live for all time, although not now scientifically up to date, as Miller was a pre-Darwinian.

Now these opportunities to grow are about the dentist on all sides, but rarely is advantage taken of by them. Did the dental profession but develop itself, then its position in the world's estimation would rise by leaps and bounds. And better still, the dentist's enjoyment of life and its living would be increased immeasurably. The extension of their view would be similar to that of the man who is suddenly lifted from earth by the ascent of a balloon.

A little girl was once asked the question, "Who made you?"

"Dod made me only so long," replied the tot, indicating with her hands. Then raising her head in pride, she added: "I did all the rest myself." The average dentist is unlike that little girl. He is made just so long by his school, or his college, or his God, and he never makes himself a bit longer. In youth he is stamped for life, and the stamp is never changed, it merely grows fainter and fainter with the years.

It may be urged that the same is true of the majority of the men in any profession. It is, but I think in a less degree, from the fact that it is possible for a dentist to practice without using his brains. Of course he does not practice as he should, but he can practice in a way, and possibly with good results financially. On the other hand, the physician and the lawyer must perforce think once in a while whether they will or no.

Thank God our field is not entirely sterile! We have men like Wells, and Morton, and Miller, and Black to whom we can look up in reverence. But they are far too few, far too few. As for us of the rank and file, I fear we merit nothing better than the title "tooth carpenters." The evidence may be circumstantial, but, as Thoreau says, "Some circumstantial evidence may be very strong, as for instance, when you find a trout in the milk."

We as a profession are not readers. I would that I could see the profession in that stage of development. It is only through reading and the resulting mental stimulation that cultured men are made. And in the process of making they experience the greatest pleasures and the most lasting pleasures of life.



Lord Macaulay said, "If anybody would make me the greatest king that ever lived, with palaces and gardens and fine dinners and wine and coaches, and beautiful clothes and hundreds of servants, on consideration that I would not read books, I would not be a king—I would rather be a poor man in a garret, with plenty of books, than a king who did not love reading."

The dental college these days receives a good many raps which it does not deserve. The profession could occasionally kick itself with more justice. But that is not the way of human nature or human institutions. We always like to blame our defects on some one else.

The cry has been that the college must pound more science into the student's head. I say, "God forbid!" It does enough pounding now. Let it inspire more and pound less.

A dental graduate should leave college firmly imbued with the idea that one of the chief ambitions of his life should be the acquiring and constant use of a library of useful books, not neurotic, erotic, or tommyrotic books, but books that stand for something in the world of intellect. He should have been made to realize that his whole future mental development and happiness depend very largely upon it, that it will open up to him new worlds—externally as well as internally—and that it will advance both him and his profession in the estimation of the world as nothing else can, enabling him to take a stand among cultured intellectual people wherever he may be thrown. All this may result and does result from the possession and the use of a good library, and yet, even in this day of cheap books, how many dentists have good libraries?

Among cultured, thinking men the standing of the dentist is not what it should be. I have many times been placed in positions where an avowal of my profession resulted, I could plainly see, in a lowered opinion of myself intellectually. This always makes me mad, and yet—and yet—what can one do when he feels there is some show of justice in such a view. I love my profession, I am proud of my profession, but I do not love it with that blind idolatry that can see no faults.

I once had a school teacher twit me about the talk a dentist had given before her school, a talk in which the dentist had used the expressions "I seen," "I done." I took the twitting in good part, as in fact I had to; the teacher was a good friend of mine, but I was humiliated and hurt, sorely humiliated and hurt. The opinion of all the teachers and of all the pupils in that school of the dental profession was lowered through the ignorance of that speaker. He was a worthy man and a good dentist, but is it not an abuse of words to call him an enlightened professional man?

The world honors the dentist, but it honors him as an advanced mechanic, not as a cultured man. It is much to be honored for any good we have done or are doing, but for my chosen profession I aspire to more. I want dentists to grasp the best part of any man's education—the part that he gives to himself—and really make of themselves enlightened professional men. If only we do that then dentistry, in even a decade, will assume a position never dreamed of before.

Let us expect less from the college, more from ourselves. The world after all is just. If it calls us tooth carpenters and sneers at our professional attainments, then we are at fault, not the world. Let us climb out of our rut. Let us begin to use our brains. Let us get out into our intellectual gardens and pull weeds. Let us make ourselves worthy of the coming generation instead of merely being content that we have been worthy of the past. The worship of dead ones never pays. It has kept China back for centuries. Let us make ourselves men of the future, real professional men of the future.

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## REPORT OF COMMITTEE ON ORAL HYGIENE\*

By W. T. Jackman, D.D.S., Cleveland, Ohio.

THE RECORD of another year is made and the time has arrived for the various committees of this body to make their reports. Your Educational and Oral Hygiene Committee begs leave to submit the following brief report:

While your committee on Education and Oral Hygiene has not made the progress during the past year that we had hoped for, or as the subject demanded, yet we feel that some progress has been made. Like all public movements of merit, the people must be educated, and this requires time and an indomitable will on the part of the educators. As soon as the public becomes enlightened on the subject of Oral Hygiene—as to its inestimable value when practiced, and the deplorable loss when neglected, the work of the educator will become less and less and the practical will take the place of the theoretical. And so you see, my friends, our first efforts should be to enlighten the people. How? you ask. First by giving stereopticon lectures in our public schools and before all clubs and organizations that are intended for the public good, such as Mothers' clubs, Y. W. C. A.'s and Y. M. C. A.'s or any place where you can get parents and children to listen. Then following this make examinations of the mouths of the school children, in duplicate, on forms similar to this (here show blanks), and see to it that the child's parents get a copy, and then it, at present, is up to them to have their children looked after by the dentist, or not, as they may determine. But I believe the day is not far distant when a child will not be permitted to enter the public schools unless he has had his mouth properly cared for beforehand. You may question this statement, but remember the larger cities are now segregating their tubercular children, and why not force the parents to have the diseased oral conditions of their children corrected—such diseased conditions are, as you well know, the best possible for propagating tubercular germs, except perhaps a tubercular lung itself—before coming into such close contact, as in a school room, with healthy children. I tell you, ladies and gentlemen, this must be done and the dental profession must take the initiative, and the sooner

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\*Read at Ohio State Dental Society, 1911.

we get busy the better for humanity. In our lectures to parents this point should be so emphasized that the humblest listener could grasp it. Would that I had the ability to so impress upon this body the greatness of our responsibility so that each member thereof would go home from this meeting with the firm resolve to begin this campaign of oral education for the public good in his own town. This society will stand by you in this work by furnishing you a stereopticon, slides and printed lectures; also lecturers, if desired; and examination blanks when you are ready to examine the school children. The course to pursue is first to give lecture or lectures after first thoroughly advertising them. After the parents hear the lectures the most of them will be only too glad to have the mouths of their children examined, and then those who can to have them properly cared for. In most cases it is because of the deplorable ignorance of parents that we find such a lamentable oral condition of most of our school children—from 90 to 98 per cent needing dental help. Now, my friends, the harvest is ripe for the garnering; the harvesting implements are ready. Are you? I pray you take a broader view of your calling than the mere office outlook. It is marvelous what a few hustling dentists in this country have accomplished in the past two or three years along this line; but when the rank and file get busy the good results will be beyond mathematical calculation.

Ashtabula gave lectures and examined their school children the past year, Chagrin Falls is about to begin, Columbus has done something and is getting in line for more work, Cincinnati and Cleveland have been busy in giving lectures and free clinics, and other places are getting ready to begin. Appended hereto is a short synopsis of the work of the past year in Cincinnati by Dr. S. J. Rauh and his co-workers; of Cleveland by Drs. E. L. Pettibone and Frank Acker; of Columbus by Dr. E. W. Martindale, and of Ashtabula by Dr. J. H. Linsley.

These reports I read in part only, but they will be published for your perusal; they are most interesting and should be read by all.

#### ORAL HYGIENE MOVEMENT IN CINCINNATI, OHIO

Dental inspections have been held in the city of Cincinnati for three years; 14,886 children were examined, of whom 12,205 (90%) required dental interference, in addition to this, a number of those remaining had filthy mouths.

In September, 1910, the free clinic was opened. It is situated in one of the public school buildings, the city providing rent, light, power, etc. The municipality also furnishes us our forms for dental examinations.

The clinic is maintained by private subscription, the Cincinnati Odontological Society contributing \$500, the remainder of the fund was collected from individuals.

Exhibit "A" is the expense account of the clinic.

Exhibit "B" is the work performed.

We employ two dentists, each working half a day. Owing to the difficulties encountered at the beginning, the work the first few months is not as great as we expect it to be in the future.

From our experience we should emphatically recommend that paid workers be employed wherever it is practicable. We employ a young woman whom we are educating to have charge of all the work outside of the operating; this includes dental inspections, etc.



Inspections are performed by volunteers from the Odontological Society. A permanent lecture committee of about ten men talks before the mothers' clubs, school children, and any organization requesting its services, the stereopticon being used in most cases.

We are attempting at all times to impress the municipality with the necessity for this work, the health department, and the superintendent of schools being in sympathy with us. They have recommended an appropriation in this year's budget. Whether it will be granted or not the future will decide.

This year general inspections will be held as heretofore. The clinic is operated along the same lines as last year and more volunteers have been secured for inspection and lecture work than ever before.

In September, 1911, we started an experimental class in the Sixth District school, following the lines, to some extent, laid down in the Cleveland movement, the difference being that we are handling an entire class room of forty-eight children, not selecting them on account of inefficiency or defectiveness. Psychological tests, physical tests, social surroundings, dental tests, masticating instruction, etc., form part of this work. In addition to this we have a so-called "Control Class," which is in the same school, same grade and same class of children. They are put through all the tests but receive no treatment.

At the end of the year we shall further report and compare these two classes.

Respectfully submitted,

SIDNEY J. RAUH.

#### REPORT OF THE WORK OF THE FREE DENTAL CLINIC SOCIETY, CINCINNATI, O., 1910-1911.

	Amalgam .....	2,042
	Cement .....	430
Fillings.....	Copper Cement .....	52
	Gutta Percha .....	4
	(Arsenic .....	178
	Other Treatments .....	860
Treatments.....	Canals Filled (in teeth).....	242
	Prophylaxis .....	507
	Crowns Set .....	13
Extractions.....	(Permanent .....	99
	(Deciduous .....	551
	Finished Cases .....	524
	Unfinished Cases .....	143

42 cases refused to have work finished.

3 cases applied but went to work before finished.

1 case no work necessary (11 years of age).

2 cases deciduous teeth, no work necessary.

19 cases refused—found able to pay.

11 cases cleaning only needed.

22 cases going to their own dentist—some work done at clinic.

27 cases applied but never returned for treatment.

67 cases applicants for next year (too busy); could not be taken at the time of application. Fifteen of these cases received relief and some treatment.

Cleveland, O., Nov. 25, 1911.

Dr. W. T. Jackman,

Cleveland, Ohio.

Dear Dr. Jackman: Our lecture committee gave oral hygiene lectures in forty of the public schools in Cleveland to an estimated attendance of nearly 14,000 people, in

cluding both parents and children. At some of the schools we were compelled to turn people away, so great was the crowd anxious to receive our message. This was the rule in the foreign neighborhoods, and those of us who have seen the interest and attention of some of these new Americans at our lectures consider ourselves well repaid by their esteem for all of the time we gave to this work.

We re-wrote and tried out the lectures again and again until we believe that the lectures, as you have printed them, meet all requirements for our work.

The Ohio State Society's lantern is a most excellent one and the equipment is complete enough to meet the most exacting demands.

The State Society is to be congratulated upon the most excellent work accomplished in Cleveland through the assistance of your committee.

Under your committee's direction I had the very great pleasure of giving a lecture on Oral Hygiene to 1,100 people, the capacity of the Ashtabula City Hall, on April 28th, and we have arranged two other meetings for next month; the first at Olivet Baptist Church, Bridge avenue and W. 52nd street, Cleveland, as part of a series of neighborhood meetings, to hear "Health Talks," and the second one at Chagrin Falls High School for the pupils and parents of Chagrin Falls.

I am enclosing one of the forms we are sending to dentists when they have received permission to give the lectures.

Yours for the success of Oral Hygiene,

(Signed) E. L. PETTIBONE.

Cleveland, O., Nov. 27, 1911.

Dear Doctor Jackman:

As per request for brief report of clinics in the Cleveland Oral Hygiene movement, I submit the following for your use in state report:

From May 4th to December 22nd, 1910, there were opened for the use of indigent children six free clinics, namely, in Lawn, Marion, Sacket and Stanard Schools and in St. Alexis Hospital and West Side Library, the latter two largely for parochial schools. These clinics were open in all 334 half days, treated 372 patients; work done including 1,334 fillings, 180 proph. treatments, 703 other treatments, viz.: 148 analgesic and antiseptic treatments, 8 pulps capped, 60 devitalizings 10 pulps extracted under cocaine pressure, 58 pulps removed, 155 cresol treatments for abscess, 2 sulphuric acid, 46 special, 62 root fillings, 154 miscellaneous (mostly for toothache), including extractions. The advice of the Oral Hygiene committee was that only extractions absolutely necessary be done, because of effect on attitude of children toward a new movement, and so what might have proved large figures according to wishes of parents was held down to very few extractions.

The demand for clinical services was little at first, but as examinations progressed was soon more than we could supply with out limited finances in all except the parochial clinics, where the children, for some reason, did not come as anticipated. In the public schools the teachers, appreciating the work, helped the clinic, and all during 1911 there have come requests to me for more services.

Trusting this will supply material sufficient for your purpose,

I remain respectfully,

(Signed) FRANK ACKER.

Columbus, O., Nov. 16, 1911.

Dr. W. T. Jackman,

Cleveland, Ohio.

Dear Doctor Jackman: As a member of your committee, known as the Committee on Education and Oral Hygiene of the Ohio State Dental Society, I beg leave to submit the following report.

Have sent letters out to leading men of the profession in thirty counties in my district, explaining to them again the general plan and object of the State Hygiene and

Educational Committee, and received reply letters from about twenty, giving report of progress in the work, such as lectures in the schools and to parents, and from Findlay, Norwalk, Delaware, Chillicothe, Gallipolis and Marysville inspection in the schools has been taken up, and later reports from some of these centers are thorough. In Columbus we met strong opposition to anything like dental inspection, and after a hearing before the Board of Education "nothing doing" was the echo coming back, though no report was made by the hygienic and school policy committees, which jointly gave our committee a hearing. We did, however, get some encouragement from the school extension commission upon which were two members of the school board, of some prominence, and five illustrated lectures were scheduled for the winter season in as many sections of the city. An arrangement is being made for still other additional centers for this work to continue.

The Columbus Dental Society, through its Committee on Education and Oral Hygiene, of which I am chairman, has established and equipped a free dental clinic and is now taking care of from three to six children each afternoon, who are under the supervision of the Diet Kitchen Association. This work is creating a great deal of interest in Columbus, and in fact in the state.

The members of the local society are taking care of these cases by doing work, taking turns in alphabetical order, and thus each man has an intimate part and gives of something in time and effort. An equipment adequate to render the service required is in place and a young lady in charge, who makes all arrangements with the school authorities and has them on hand at the proper time. Blanks are on the desk and a full report of each case is filed by her and kept for future reference.

Respectfully yours,

(Signed) E. W. MARTINDALE.

#### REPORT OF ASHTABULA SCHOOLS

Total number examined .....	961
Number of good gums.....	576
Number of bad gums.....	417
Number of good mouths.....	725
Number of mal-occlusion .....	305
Number of bad mouths.....	270
Number who used tooth brush.....	621
Number who had teeth filled.....	281
Number who need no dental work of any kind.....	87
Number of six-year-old molars extracted.....	181
Number of decayed teeth.....	357

The dentist who examined this school examined only the permanent teeth.

Number of good mouths.....	143
Number of bad mouths .....	99
Number of good gums .....	149
Number of bad gums .....	91
Number of tooth brushes used.....	40
Number who had teeth filled.....	18
Number of mal-occlusion .....	37
Number of decayed teeth .....	785
Number of six-year-old molars extracted.....	46
Perfect mouths as to permanent teeth.....	116

P. S. I did not include in the total number of pupils examined those in this last report, so it will make 1,203 in all.

JAMES H. LINSLEY.

I wish here to call your attention in particular to the test class of twenty-seven children of the Marion school, Cleveland, their working efficiency being almost doubled in one short year by giving them proper den-



tal and oral care and teaching them how to eat. This class appeared before the National Dental Association in Cleveland last July and in connection with their appearance Miss O'Neill, principal of Marion school, read a paper relative to this class and the results obtained. This paper will be published in the December number of the *Dental Cosmos* and I trust you will all read it carefully. After the reading of the paper and the presentation of the class all present marveled at the results.

Now, Mr. President, I suggest that this body give as much money as possible during the coming year to the end that reprints of this paper may be placed in the hands of as many educators as possible throughout the state. Those of you who heard this paper will agree with me that there is no one thing that will so arouse our educators as to the necessity of this work as will this paper.

One thing more and I will have done.

During the convention of the National Dental Association last July, in Cleveland, a new organization was formed, under the sanction of the National Dental Association, known as the National Mouth Hygiene Association, of which Mr. Horace Fletcher of New York is president and Dr. W. G. Ebersole, Cleveland, secretary-treasurer. This association proposes to interest everybody who is philanthropically inclined; in other words, it is a layman as well as a professional movement. This movement has been more fully explained to each of you in a letter which you received but a day or two ago from Dr. Ebersole. I want to say to you that Dr. Ebersole, if God gives him health, will make good every promise he has made you in that letter, and if you will but support this movement it will, in my judgment, prove to be the greatest step the dental profession has ever taken, not only for the good of the present generation but for untold millions yet unborn.

Respectfully submitted,

SIDNEY J. RAUH,

E. W. MARTINDALE,

W. T. JACKMAN, *Chairman.*

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### SULPHURIC ACID A SILVER SOLVENT

Sulphuric acid has displaced nitric acid as a silver solvent in refining precious metals. It has a decided advantage in the quartation method when platinum is a component of the alloy, as both gold and platinum are insoluble in sulphuric acid under all conditions. An alloy of platinum and silver, when the silver is largely in excess, is quite soluble in nitric acid. Another advantage, it is much less expensive. It is well to bear in mind the solvent action of sulphuric acid on silver when "pickeling" a silver denture. The cold acid is not very active, neither is a dilute acid. When heat is used to hasten the pickeling, the boiling solution under some circumstances first parts with its water, thus strengthening the acid solution, and a point is soon reached when an active action on the silver begins. It is a wise precaution to always see that the pickle dish is full, adding water to make it so as long as it continues to be a solvent for the fused borax the pickeling is used to remove.—*Items of Interest.*

## IDEALS

By Dr. D. S. Leet, Pittsburgh, Pa.

(Continued from page 309, April Summary)

Socialism is not a fad, a cult, or a sect. It is neither Utopian nor chimerical. Socialism is a science founded upon the laws of evolution, and its political expression today is but the expression of those who foresee the benefits of its application. To be thoroughly understood Socialism must be studied. It is not enough that one of its disciples should make assertions, plain though they may seem. The source of your knowledge must be beyond question. You cannot expect to get a clear understanding of Socialism from the lips of its enemies.

If you were to study Christianity you would scarcely rely upon the work of an atheist for your knowledge, but would go at once to the source of that teaching. So if you would know Socialism you must study from its masterpieces. Karl Marx is to Socialism what Darwin and Wallace are to the evolution of species. He has shown conclusively that the law of evolution applies to society no less than to an animal species. His great work, *Capital*, contains the foundation of the subject to which I allude, but many authors have condensed and elaborated the salient points, so that a general knowledge may be obtained with the minimum of effort. I cannot too heartily recommend *The Struggle for Existence*, by Walter Thomas Mills. A careful perusal of this work will enlighten you upon those points that seem most obscure.

Geological and anthropological research have disclosed the fact that our earliest savage ancestors were examples of individualism. They enjoyed no social intercourse and sex relations were promiscuous, but during the transition from savagery to barbarism certain evidences of social relationship became apparent and the inventive element became accelerated.

The advent of civilization is marked by the introduction of the alphabet, continued wars, slavery, and the beginning of the *class struggle*. The leaders in war began to appropriate land and slaves for their own use, whereas the whole tribe or nation had formerly been jointly benefited by the conquest. This inevitably created a division of society into two classes—the laboring class and the land-owning class—and here is where capitalism, the acme of which we have reached today, first makes its appearance.

Labor became the badge of servitude and disgrace. The laborer was discredited, disinherited, disfranchised, and the age-long, world-wide economic class struggle made its beginning. It had been found, as human wants were becoming so diversified, better results could be obtained by each man working at the completion of some particular article, the result being the community supplied by the minimum expenditure of time and

labor. This was pre-eminently the age of the craftsman. But through it all, the worker, with the exception of the slave, *was the owner of his tools*. It being recognized even by early civilization that to deprive a man of his tools was to place him at the mercy of the one who owned them, and so at a comparatively recent date there were laws upon the statute books that made it impossible for a creditor to deprive a man of his tools in payment of debt.

At this point, however, a change takes place in the mode of production which is of momentous import to society—the invention of labor-saving machinery. It is now found that by the introduction of the machine one worker can produce that which formerly took the united efforts of fifty men. The result, as in the tribe, should have been a decided increase in the leisure hours of labor; but was that the effect? And if not, why not? It was found that the initial cost of installing these labor-saving machines was considerable, and here capital comes to the rescue. *The capitalist becomes the owner of the tools*. The worker may elect to cling to the old cumbersome implements of production, but for obvious reasons he finds that he cannot compete with the machine and is obliged to surrender his birthright. The capitalist having become an employer of labor now finds that by reducing the wages of labor he may add to his own wealth by appropriating part of the result of labor's efforts. In other words, labor, while creating all value, receives in wages only a part, the balance, the surplus value of Marx, passes into the possession of the capitalist.

The laborer at no time can buy of the finished product more than the amount of his wage. The surplus value is disposed of in the open market for profit. The danger from this surplus I will soon make evident. Other capitalists having invested in like enterprises, results in competition becoming intense as markets for the product become scarce. One manufacturer, finding that his capital is not bringing sufficient returns because of keen competition, resorts to one of these expedients: A reduction in wages, or a lengthening in the hours of labor (which amounts to the same), or a cheapening of the quality of the product. Such action invariably calls for similar action by his competitors, the net result of competition being an inferior product and a poorly paid laborer. But now competition has reached that point where it becomes destructive, and something else must happen. One capitalist, because of greater business foresight, or special privilege, makes it impossible for his competitor to continue in business profitably; or, both seeing the ruinous results of competition, conceive the idea of combining into great corporations or trusts, limiting their output to maintain prices, and by installing still more colossal labor-saving devices, lessen the cost of production. This action displaces much skilled labor.

This labor, having no tools of its own, must sell its ability to the highest bidder. Where shall he sell it? Even under bonafide competi-



tion he had a chance; now he has none, as the trust is the only one that employs his kind of labor. Labor has ceased to be independent. Should he demand increase in wages he is told that he may go, as there are others to take his place at the same or less wage. About one such experience would teach you that man's ideals are clearly influenced by his economic needs. The capitalist becomes a power in politics, as you all know.

Every effort is bent to secure broader markets that the flow of dividends may increase. Wars are the result of this struggle for markets. Industrial supremacy is maintained by naval supremacy. The open door policy of this country for China means simply that China is a big market and we want in on it. Why do you suppose we acquired the Philippines? Benevolence? No; more markets! And now to illustrate the serious effects of capitalist competition with special attention given to surplus value.

The wheels of industry hum in our factories. Smoke belches from thousands of stacks. We are enjoying a period of "unprecedented prosperity." Our crops were never more bounteous. All nature seems bent on pouring her offering into our laps, but suddenly from some mysterious source, capital (not you and I), gets word from its representatives in foreign markets that the market is overstocked and goods may no longer be sold at a profit. This is advance information and does not reach our ears. The mills curtail production; labor works only half time. Great financial concerns see it coming; loans are called in, small concerns are caught unawares, failures ensue, and the panic is upon us. Mills close down, thousands are thrown out of employment and we are confronted by that sad anomaly of starvation in the midst of plenty. The capitalist places watchmen in his factories and hurries abroad to rest and recuperate. The laborer—God knows what he will do!

The Socialist solution for this horrible state of society is that the workers, being in a very great majority, and therefore constituting society itself, must take possession of the machinery of production. All things collectively used must be collectively owned and operated. Production must be for *use*, and not for *profit*. This would usher in the birth of the co-operative commonwealth. As evidence of its practicability he will refer you to the public roads, postal service and public schools of our own country at the present time, all of which are highly Socialistic in character. He will cite you the railroad and telegraph service of other countries under government control. He claims for this change of system that all who are willing to work shall have the opportunity; and he who will not work—that is, render service to society, shall not eat. He provides for the care of the old and infirm when he shall have passed his period of usefulness to society. He will show you that the hours of labor will be incomparably shorter. That under a co-operative system men and women will have time to improve their minds. Lofty ideals may be attained; suicide and drunkenness will no longer persist. Destitution and prosti-

tution will no longer prevail. To substantiate all this he will give you facts and figures, page and number.

I can conceive of no higher ideal than that for which the Socialist contends. His is a propaganda for the welfare of all mankind. His is a movement world-wide in its scope. With the adoption of Socialism by civilized nations, the battleship will be consigned to the scrap heap, nevermore to be resurrected. The standing army will be obliged to beat its swords into pruning hooks, and "Peace on earth, good will to men," will be an accomplished fact.

As members of society this subject can scarcely fail to be of interest to you. As dentists, I believe it should make an impression on your minds. Assuming that you are each striving for the ideal, you have within you those qualities that artists possess. John Ruskin has said that "Art is the expression of the worker's joy in his work." If there is among you one person who has for his sole and only object in dentistry the attainment of wealth, I pity him. The world will scarcely miss him when he is gone.

I have endeavored to show that a thing that is for the collective benefit of society must of necessity be of benefit to its units. Upon this postulate I shall now endeavor to show that the establishment of Socialism will benefit you. That under a co-operative system of society the highest ideals may be attained, whereas under capitalism and a competitive system those ideals are seldom, if ever, realized. The ever present and ever increasing difficulty of supplying our economic needs results in the constant and increasing application of mental and physical exertion to the attainment of those ends. In proportion as those needs are satisfied we are allowed the formation, contemplation and attainment of ideals. Our interest should be with the proletarian class, as our work is largely the work of our hands. It has been pretty generally demonstrated in recent years—and the Socialist lays stress upon the fact—that men by their individual exertions do not become wealthy. The proletarian works; the capitalist works—the worker. In other words, he appropriates a part of the efforts of labor and his wealth is determined, in a large measure, by the number of workers he is able to employ.

The very nature of our occupation makes it next to impossible for us to become of the capitalist class. Our "code of ethics" is a barrier against it. The nearest approach to capitalism we may find in the profession of dentistry is the advertising dentist of the "Painless Parlors," and he is the only one who is becoming wealthy in our ranks. He employs an irresponsible force of men and *his prices* largely determine the *average price* of dental operations for the profession. You will scarcely deny that his influence upon your business is considerable. The working class—and they are in a constantly increasing majority—are, because of their economic necessity, drawn to the cheapest market for their operations, or they come to you for better work, and you wait for your pay: or, they

go without dental service. It now seems that you, as a class, are confronted by the following conditions: A rapidly increasing number of dentists; a rapidly decreasing surplus of your patient's wealth; no diminution in the cost of your dental supplies; a progressive increase in the cost of your economic necessities. The results must of necessity be an increase in the number of your bad accounts, a cheapening of your prices and a corresponding cheapness in the quality of your output, a shortening of your hours of leisure, the receding of your highest ideals. An army of dentists eking out a precarious existence is the spectre that confronts you. A few, because of their faculty of mixing with those who possess the wealth, will succeed—as the world now measures success—not especially because they are better qualified to perform dental operations, but because of social environment, religious affiliations, matrimonial alliances, etc. It is my own belief that no dentist can attain financial success and remain ethical. In other words, as a working basis our "Code of Ethics" is obsolete and meaningless.

I have now indicated the trend of events as regards the dentist under our present system of competition. Let us see what we may hope for under a Socialistic system of co-operation under Democratic direction; that is, your own administration of dental affairs insofar as it concerns the best interests of society. We have previously seen that one of the ideals of the dentist is the attainment of a financial competency—not for the mere possession of money, but because of the power it confers upon its possessor, enabling him, as it does, to attain "life, liberty and the pursuit of happiness" for himself and those dependent upon him. Assuming now that he may enjoy all these benefactions without a large surplus of money, and with only the minimum of physical or mental labor we clear the way for the conception and attainment of ideals otherwise completely overshadowed by his material needs. Obviously the dentist does not produce all that he consumes, therefore a medium of exchange is necessary; but exchange, under socialism, will be conducted upon the theory of labor-power exchanged for equal labor power in other products and will abolish exchange for profit, and private manipulations of bankers. Whatever he used as a medium of exchange will make a record of production in one instance and of consumption in the other.

Investigation has shown that were man to get the entire proceeds of his labor he would be required to work only about one-fourth as long as he now does to provide the same amount of this world's goods for himself. Would that not provide you with leisure to improve and attain your highest ideals? No doubt many of you will say, "If there is no money in it I certainly would not choose dentistry for mine." And right here again society profits by getting its blacksmiths and carpenters out of the dental ranks into the sphere for which they are designed by nature. And the profession of dentistry is immeasurably benefited in that it becomes a Guild of Artists.



Very likely you will conclude that Socialism is a dream and impossible of realization, but signs are not wanting to show that it is inevitably the next step in social evolution. And to those who will investigate those signs point to its consummation at no very distant day. The present competitive system is self-destructive, and Socialism is its logical successor.

I advise you all to investigate this subject, which is the most momentous since the dawn of civilization, and one which is to elevate the profession of dentistry to its highest ideals.

### DR. ADAM FLICKINGER HONORED

THE NINTH annual banquet of the St. Louis Society of Dental Science was given January 20th, at the Jefferson Hotel, in honor of Dr. Adam Flickinger, who has practiced dentistry continuously for forty-nine years. His youthful and active appearance would do credit to a much younger man. His work has been a great benefit to the profession and an inspiration to the younger men. At present Dr. Flickinger



DR. FLICKINGER

is engaged in some research which, when consummated, will relieve the dental profession of a burden which has been hard to bear.

The banquet was a round of pleasure, enthusiasm and compliments. A special musical program was given by Mrs. Val H. Fredrich and Dr. E. J. Lenzen.

Following are extracts from the toasts. The Toastmaster, Dr. J. P.

Marshall, after some clever remarks, called upon Dr. E. P. Dameron, who responded as follows to the sentiment "Our Guest":

## OUR GUEST

We have now reached the, to me, pathological portion of this post-prandial pow-wow, for if there's anything that will accelerate the heart beat, elevate the temperature and depress the appetite it is the knowledge that one will be called upon to make an after-dinner talk. It is not as free from restraint as though one were at home, in his shirt sleeves, with his feet under his own mahogany and permitted to eat with his knife and growl about the grub.

As we proceed with our speech we hope none in the audience will interrupt with questions relative to the tariff, Schedule K and allied subjects; it might cause a memory panic or brainstorm in your speaker.

There is an old college ditty that runs—

"We're here because  
We're here because  
We're here because  
We're here."

To the feminine mind "because" is a good and sufficient reason for all and divers things. We admit that our experience teaches us to accept it as final when given by a member of the gentler sex, but I am sure those who are here this evening will for once, at least, admit that there may be a better reason than "because," and that is—we are here to do honor to one of Nature's noblemen, our guest—Dr. Adam Flickinger.

We are proud to be here tonight to do him honor, to encourage him to renewed efforts and, in doing this, encourage others to follow in his steps—to let him know that he is loved and appreciated.

As the world grows older and altruism becomes more a guiding star, one of the delightful and useful customs is to give men full credit while they are yet with us—

"Why should good words ne'er be said  
Of a friend until he is dead?"

And so we are here to do honor to this man—our friend and brother.

The personality of any man who achieves things is interesting, and moreover it is of value to others bound by the common tie of sympathy and aspiration, and the man without aspiration is dead; he may perambulate, but animation is not always a sign of life. The dead and dry leaves are caught in the whirldwind and circulate, but they have not life. There are all about us men who move around, are able to articulate, to eat and drink and see and hear, but they are dead—just as dead as though the undertaker had performed his offices and the procession had gone home. Dr. Flickinger has always been a live one, his hopes and aspirations high, his energy boundless—he has ever kept in touch with the spirit of the times; new inventions, new processes are hailed by him with as much delight as though he were a beginner, especially if those processes simplified and made his work easier and more humane for his patients. The spirit of the times—progress, advancement, pressing on—that is the spirit of our friend. He believes that the men who do things today are the men who succeed, and by precept and example he daily teaches us to hustle and fill our minds with cheerful optimistic pictures, pictures of achievement, and while he works he yet finds time to play, and the bounteous hospitality of Dr. Flickinger, his charming wife and lovely and accomplished daughter is still fresh in our memories—how we did enjoy ourselves! Surely we can never forget it, and while he works and while he plays we sincerely hope and trust he may escape the ills that befel

"A fair damsel who lived down near Attica,  
Who went searching in March for hepatica,  
But garnered the grip  
And toothache on the trip,  
And lumbago as well as sciatica."

Dr. Flickinger is a pioneer—a pioneer in the dental profession, and has successfully met and mastered the many vicissitudes that all pioneers encounter, and the saying “Adversity has the effect of eliciting talents that in prosperous circumstances would have lain dormant” is no doubt well understood by him. He is now rounding out nearly half a century of active practice in his chosen profession, and the many changes in its advancement he has witnessed is ever an interesting theme, whenever we have persuaded him to talk. You will note I said *persuaded* him to talk, for the doctor is not living in the past but working in the present. Someone has said, “The man who dwells in the past is a confessed failure—he is ‘all in.’” The man who is eternally dreaming of the future is a human rainbow, an iridescent vapor, but the man who lives in the present, works in the present and thinks in the present is the man who makes the future and causes the great whirling wheels of the world to go ‘round. Our guest lives, works and thinks in the present.

It was Fuller who said, “The real difference between men is energy.” As a living example of energy and enthusiasm, Dr. Flickinger has no peer in the profession. He is a man who does things, and it would be easier to enumerate the things he has not done than the numerous things that he has. But after all, it is as a scientist, a searcher after new truths that we most delight to honor him. “Glittering and attractive is the fame and adulation given to the world’s heroes.” The orator, who with matchless eloquence sways our minds and our hearts, possesses a transcendent gift. The sculptor, who carves forms to elevate and instruct, is held to be gifted of God. The painter, whose canvas breathes smiles and sunshine or depicts tragedy and woe, is in high reverence. The musician, who weaves a spell as composer or interpreter, gathers our heart-strings in his grasp, bringing tears and laughter and we bow to his wand, but the scientist, who has by his laborious investigations arrived at even one valuable and important fact and made it into workable form, has gained a place in history which will be acknowledged long after heroes, sculptors, painters and musicians are forgotten.

The scientist who unearths riches, and by that adds to the sum total of adaptable truths by which human life expands and human misery is alleviated, makes for himself a monument builded by his fellow-man, he hath no enemy, all alike do him honor. The whole life of Adam Flickinger, our guest, has been one of meritorious action and worthy of emulation, as a man, a husband, a father, a friend, a scientist—we honor him.

#### LIFE

Dr. R. C. Blackner, having been called upon to respond to the sentiment “Life,” spoke as follows:

Herbert Spencer, in his great book on the First Principles of Biology, defined Life to be a “definite combination of heterogeneous changes, both simultaneous and successive and in correspondence with external co-existences and sequences.” If I had been called upon as an expert to pass upon this definition, I should doubtless pronounce it very correct, very clear and withal satisfying. The words sound a bit large to anyone not quite familiar with Mr. Spencer’s diction, but are good words nevertheless.

In contemplating the phenomena of life, almost the first fact that strikes our notice is its changeableness. An organic body is never at rest. Life is always in motion, by day and by night it is forever surging to and fro. Swifter than a weaver’s shuttle it flies from birth to death, from death to birth. From the beginning it seeks the end but finds it not, for the end is only a dim beginning of a new outgoing and endeavor to find the end. These changes do not form one series alone, but many series, going on at the same time, hence they are simultaneous and successive and working in harmonious combination. These changes are not all of the same kind nor for the same purpose, hence they are heterogeneous. The combination serves a definite end and possesses both parents and posterity, hence there is a definite combination in correspondence with external co-existences and sequences. This definition walls off the phenomena of life from all other phenomena, as most scientists agree.

The educated mind may easily contemplate a time when the elements and materials of creation lay blended together without distinction or form and when darkness brooded



upon the face of the great deep. It may even contemplate the Divine Will, developing the mass from chaos to perfection. I suppose the ignorant mind may imagine or think it imagines God calling this vast universe into being out of nothing. But the cultivated and enlightened mind, familiar with the laws that govern the indestructibility of matter and the conservation of energy and that hopes for immortality, must ever perceive matter, energy and life, these three primitive principles as being co-eternal with God himself and manifestations of his infinity. The ancient and romantic alchemists studied the phenomena of matter, because they hoped its several forms might be transmutable, and if they could once discover the universal solvent, the commoner metals might be turned to gold. Their hope was vain. They succeeded in reducing all substances to about seventy primitive elements and they traced these through innumerable combinations, but gold remained gold, iron remained iron, and lead remained lead. As they went into the crucible so they came out—undiminished and unincreased—and when they had arrived at the great fact that matter was indestructible and uncreatable they found that they themselves were no longer alchemists, but chemists.

The natural philosophers sought the source of energy, because they hoped to discover a perpetual motion machine, a machine which could generate its own running power. Their hope was vain. They found that it was the same energy that manifested itself in the form of heat, light, electricity and dynamic force. They were transmutable under certain circumstances, but these also proved indestructible and uncreatable. The sum was always the same. With the same measure as they did mete, it was measured to them again, nothing gained and nothing lost.

The biologists began to study life, because they sought the fountain of perpetual youth and earthly immortality. Their hope was also vain. They early perceived the manifestations of energy in living bodies. They saw that the energy displayed in the contraction of a muscle differed in no essential particular from that manifested elsewhere. The chemical changes which took place in an organic body were the same as exhibited in one inorganic.

Still there was here something over. They could bring into combination all the elements of the organic cell, but they could not breathe into it the breath of life. They were inevitably drawn into the conclusion that matter came only from matter, energy came only from energy, and that life came only from life. Like the breath of the wind, no man knew whence they came nor whither they went, save that great fact alone. That they were eternal, reckoning backward to the dim and misty past, they knew; that they were immortal, they hoped; but such knowledge was high and they could not attain unto it.

Yes, life came from life. Socrates had proclaimed, through the pen of Plato, this famous proposition: "The living come from the dead. If life came from anything else than from death and all living die, eventually all things will be dead." Life will become exhausted. And they represented eternity under the symbol of a serpent with his tail in his mouth, a circle. Life is not destroyed but simply hidden in death. St. Paul, in his argument for the resurrection, drew an illustration from a grain of wheat placed in the ground. He said, "The grain is not quickened except it die." The analogy may be convincing, but the fact is false. Most assuredly the grain is not quickened, if it does die, and we of later day perceive the truth of latent life. The life in the grain germ sleepeth to wake in the spring to a new and multiplied existence, and here, as elsewhere, life becomes immortal through its posterity.

Matter, energy and life, these three great primitive principles, distinct as they are inextricably bound together by the cords of what romance might call the Great Desire. Every particle of matter in the universe attracts every other particle and they hasten to unite, though endless space separates them. Energy exhibits positive and negative phenomena. The lightnings leap from cloud to cloud to join and become latent in a no less magical union. Life also manifests its activity to satisfy the Great Desire, and cell unites with cell in the marvelous process of generation. In specimens as artificial and degenerate as the human race—"two shall be borne the whole wide world apart

and speak in different tongues and have no thought each of the other's being and take no heed. Yet these o'er unknown seas to unknown lands shall cross, escaping wreck and defying death and all unconsciously shape every act to this one end, that one day through the darkness they should meet and read life's meaning in each other's eyes." Blind though they are, insensible though they are, ignorant though they are, when they meet they shall see and feel and know and become latent in supreme satisfaction. And this helps us to understand that "All are but parts of one stupendous whole, whose body Nature is and God the soul, that lives through all life and extends through all extent, spreads undivided and operates unspent. To him no high, no low, no great, no small. He fills and bounds, connects and equals all." Thus through all the universe flows the Great Desire, and Love is the fulfilling of the law of life. Life the Eager, Life the Striving, Life the Abundant, Life One and Universal, no matter in what one of its innumerable forms we see it. The Life that in the beginning moved upon the face of the waters. The River of Life which John saw in his vision. The Bread of Life, which, having eaten, we may never hunger or thirst again. The Fountain of Life sought of the old philosophers. The Life that was the Light of the world—Eternal Life.

Mrs. Jessamine E. Voyles, having been called upon to respond to the sentiment "Man," spoke as follows:

#### MAN

##### I

Through Eve's one little indiscretion  
 Countless aeons of bliss we lost.  
 Heart-breaks, tears, alloy our pleasures  
 Yet 'twas surely worth the cost.  
 For it brought to light a factor  
 Most important in life's plan,  
 We learned that neath his noble mien  
 Abiding weakness dwelt in man.

##### II

In an epoch now forgotten  
 Our ancestral halls were trees—  
 The lion's roar and serpent's hiss  
 Caused blanching cheek and quaking knees.  
 Did One Man swiftly seize his bow,  
 His only thought to save his mate?  
 His arrow sped—he climbed a tree  
 And left her to her fate.

##### III

The age of chivalry produced  
 A man, famed both in verse and song,  
 Who, for a beauteous Queen of Love  
 Slew knights by scores, both brave and strong.  
 How enduring his devotion  
 It doth grieve us to confess—  
 Forsooth it lasted till he met  
 A fairer damsel in distress.

##### IV

Religious zeal profound and firm  
 Next filled the soul of man.  
 The Spartan fathers weaklings seemed  
 Beside this stern-browed Puritan.

A woman dare not laugh or sing,  
 And if gay frills or frocks she donned,  
 These zealots seized the charmer fair  
 And ducked her in a pond.

## V

The twentieth century dawned, and lo!  
 Ambition fires the breast of man  
 Fame to achieve, wealth to acquire,  
 Each joy to taste in life's brief span—  
 To deck his mate in gorgeous garb,  
 Thus causing many envious thrills—  
 And this a man we all could love  
 Would he *not* grumble at the bills.

## VI

The mills of the gods have slowly ground  
 And turned out every kind of man.  
 But never made one who just suited his wife—  
 Were the gods playing pranks, or was it their plan  
 To give unto us this imperfect creature—  
 This being so faulty, so lacking withal,  
 That down through the ages our mission has been  
 To improve and perfect him, inspire and enthrall?

## VII

Till today we can point with a finger of pride  
 To the male of the species enthroned at our side,  
 And with confident spirit the future forecast  
 When a world sees success crown our efforts at last;  
 Sees a man all perfection—oh, heavenly state!  
 A man who can smile when his dinner is late—  
 A man who can laugh at the price of a hat—  
 Who dotes on receptions and teas and all that.  
 'Twas worry, 'twas trouble, e'er since time began—  
 This great undertaking of making a man.

**T**HE NORTHERN OHIO DENTAL ASSOCIATION will meet at Cedar Point on Lake Erie, on Tuesday, Wednesday and Thursday, June 11, 12 and 13, 1912. An excellent program and an especially attractive list of clinics have been provided for the three days' session. Talented men from outside states will participate in both papers and clinics.

Cedar Point is the Atlantic City of the west, and in every way suitable and inviting for the holding of the forthcoming meeting. It has a fine and commodious hotel, inviting convention hall and assembly rooms and no more complete place in the state can be found for the holding of the next annual convention. The members of the association attending will have the advantage of accommodations at the Breakers hotel, away from the attractions of the city, thus insuring a large attendance at the sessions.

Sandusky, O.

C. D. PECK, Secretary



# EDITORIAL

## WHAT LEGAL RIGHTS HAVE DENTISTS TO ADMINISTER GENERAL ANESTHETICS?

This is a subject that is of vital interest and importance to dentists everywhere, and members of the dental profession should make sure of the status of their legal rights in their respective states, for if the laws do not give them privileges required, such laws ought to be amended so that they will.

In Ohio an examination in anesthetics is required by the Board of Dental Examiners, and dentists are given legal right to use anesthetics, local and general, in the practice of dentistry.

There is, however, another phase of the anesthetic question being considered in this state, and as it is one that should interest dentists everywhere we are going to tell our readers about it.

It seems that for some time past nurses and others than qualified medical practitioners (presumably dentists making a specialty of anesthesia) have been administering general anesthetics more or less in some of the hospitals for surgical or other operations, and this practice apparently being on the increase. the subject was brought before the Ohio State Medical Board last April and opinions obtained from the attorney general of the state.

In bringing this matter before our readers we will quote first an editorial that appeared in the September, 1911, number of *The Ohio State Medical Journal*:

### THE ADMINISTRATION OF ANESTHETICS BY OTHER THAN PHYSICIANS

It has been claimed that the employment of nurses or other non-graduates of medicine to administer anesthetics in our hospitals has been increasing and considerable discussion has arisen as to the practice. While there is no question but that many such lay anesthetizers may become very expert, and that many arguments may be urged in support of the custom, we cannot but deprecate it as an infringement upon the prerogatives of our profession. There are, of course, emergencies when one must enlist the services of any one available, but the regular employment of a non-medical anesthetist is a different matter, and the arguments for the practice thus far urged upon us boil down largely to the financial consideration of cheapness. Many nurses make excellent, or even very expert anesthetists, but would they not be still better if they had a complete medical education?

This subject was brought before the State Medical Board last April and the following resolution was passed:

*Resolved*, By the Ohio State Medical Board that the administration of any drug or agent to procure general anesthesia is interpreted by the Board as constituting the practice of medicine, and the person so administering said anesthetic must be duly

qualified to practice medicine and surgery as prescribed by the statutes governing the practice of medicine in the State of Ohio.

Following the adoption of this resolution, the Attorney General was asked for an opinion covering the subject. This opinion follows:

Columbus, Ohio, April 14, 1911.

*Dr. George H. Matson, Secretary Ohio State Medical Board, Columbus, Ohio:*

DEAR SIR:—You have submitted to this department for opinion letter addressed to you by Dr. William Miller, in which Dr. Miller inquires as to whether or not it is lawful in this state for a person who is not a registered physician to administer an anesthetic under the direction of a qualified physician.

It is unnecessary for me to quote the section of the General Code which provides that no person shall practice medicine without having received a certificate from the State Medical Board. "The practice of medicine" is defined in Section 1286 of the General Code, which provides in part as follows:

"A person shall be regarded as practicing medicine \* \* \* who \* \* \* administers \* \* \* for a fee or compensation of any kind, direct or indirect, a drug, or medicine, appliance, application, operation or treatment of whatever nature for the cure or relief of a wound, fracture or bodily injury, infirmity or disease \* \* \*."

Section 1287 provides a number of exceptions to the definitions of Section 1286, but persons administering anesthetics are not included in the catalogue of such exceptions.

The question you submit to me is in the last analysis a question of fact. Unless, however, I misapprehend the technical facts in the case, one who gives an anesthetic "administers a drug," and if this is done for a compensation whether paid by the patient or not, and if done for the cure or relief of a bodily infirmity, it unquestionably constitutes the practice of medicine or surgery.

From another viewpoint it would seem that the administration of an anesthetic is a part of a surgical operation and under the law can only be performed by one qualified to perform the remaining steps in the operation.

The question still remains as to whether or not the function of administering an anesthetic might be performed by an unqualified person under the personal direction of a qualified physician, and thus, in a sense, indirectly by the physician himself. It is perfectly clear that a person need not be qualified as a physician in order to be permitted under the law to perform some necessary services in connection with an operation under the direction of a physician or a surgeon. Thus, any person may, under the surgeon's direction, arrange the instruments for him, or hand him such appliances as he needs. I do not, however, regard the administration of an anesthetic as such an act as those described. Unless I have a wrong impression of the nature of the act, it is the act of administering itself the doing of which requires technical knowledge and professional skill. That would be such an act as could not be, under the law, delegated to another by a qualified physician even though the person to whom it is delegated acts under the personal direction of the physician.

As I have already suggested, the question which you submit is more nearly a question of fact, requiring expert knowledge for its solution, than one of law, and if the facts which I have assumed are incorrect, the legal conclusion to which I have been tending does not follow. If, however, they are correct, it follows that a person not a registered physician may not administer an anesthetic under the supervision of a registered physician.

Very truly yours,

(Signed) TIMOTHY S. HOGAN, Attorney General.

It is possible that a test case may be made in the near future, and in the meanwhile we would be glad to publish the opinions of our members on the subject.

In the March, 1912, issue of *The Ohio State Medical Journal* appeared the following reply by Dr. H. C. Brown:

## CORRESPONDENCE

Editor Ohio Medical Journal:

My attention has been called to an editorial on "The Administration of Anesthetics by Other Than Physicians," appearing in a recent number of the *Ohio State Medical Journal*. Embodied in this editorial is a resolution passed by the Ohio State Medical Board and an opinion by the Attorney General, covering same. At the close of the editorial you express a willingness to publish opinions of members, and I trust that you will accord me the same courtesy and publish the views of a dentist upon this subject.

I consider the position taken in the resolution and the editorial as unjust, inconsistent and discourteous to the dental profession and will, with your permission, give a few reasons which I think may be sufficient evidence to convince the Attorney General that he was not in possession of all the facts in the case. The closing paragraph in his opinion makes it clear that it was based on the facts presented and that it was possible for additional information to modify his ruling.

The statement that the editorial and resolution did not have reference to a legal practitioner of dentistry is no consolation to the dental profession. If either recognized such a right it would and should have been specifically stated and the excuse that the dental profession was given no thought in considering the subject reflects no credit. It is true that dentistry is a branch of medical science, but it is also true that it is a distinct branch and is legalized by a separate legislative enactment.

The State Medical Board and the writer of the editorial should know that to Horace Wells, a dentist of Hartford, Conn., official recognition has been given for being the first person to use any agent as an anesthetic and to give a public demonstration of his method. This was in 1844 and nitrous oxide was the agent used. In 1846 William T. G. Morton, also a dentist, experimented with ether to produce anesthesia and met with such favorable success, in a few dental operations, that he later gave a public demonstration of this for a major operation for a physician. When the news of the discovery of ether anesthesia reached London, the physician receiving the information consulted a dentist who devised an inhaler for its administration, and it was the dentist who first demonstrated its efficiency by extracting a tooth without pain. Therefore, you will observe that dentists were most active in the development of anesthetics and official recognition has been accorded them in this country and abroad. In view of this, it would seem that our rights ought to be fully recognized by the medical profession, and that we should work together in harmony, each recognizing the rights and advantages of the other. This relation will accomplish far better results in our common efforts to educate the public to a proper appreciation of preventive medicine and dentistry.

The dental profession, like the medical, has made decided advancement since the wonderful discovery of Wells and Morton. This is evidenced by the fact that in nearly every state a diploma from a dental college is required as a credential for admission to examination before the state dental boards. The dental law of Ohio provides for this requirement and the applicant must pass a satisfactory examination in fifteen distinct branches, one of which is *anesthetics*, besides doing a prescribed amount of practical dentistry. The medical law of Ohio does not specify an examination in anesthetics and upon investigation I find that the board evidently does not consider the subject of sufficient importance to take advantage of its prerogative and give an examination in this most important branch.

I recognize that we have a great state and am keenly interested in her people and their progress. I also recognize that Ohio has furnished men from all walks in life who have brought honor to her name and, in this, members of both the medical and dental profession are conspicuous. As a citizen of such a state, I am interested in all that is true advancement and hail its coming regardless of its source, but I consider it my duty and pleasure to guard with an ever-zealous care our inherent rights in such



achievements as pioneer members of our profession have given to suffering humanity. In the interest of advancement and protection, I would most respectfully urge the Medical Board of our state to better safeguard our citizenship by making anesthetics a required branch in their examination, in accordance with authority granted in Section 1273, Revised Statutes. The same interest prompted me, a few years ago, to assume the responsibility in specifying this subject as a requirement in our dental law. This naturally stimulated the dental colleges in giving a more thorough course and the applicant a proportionate increase of study to the subject, as three terms of service on our State Dental Board convinces me that a goodly number of applicants before such boards are much more interested in the subject required by the boards than those which are not.

Few dentists are interested in giving other than Nitrous Oxide and Oxygen as a general anesthetic, but many use this in their daily practice to the great relief of their clientele. However, we have several members of our profession who specialize in anesthetics and are recognized as being quite proficient. One of these has done much to advance this form of anesthesia and has developed a special apparatus for the combining of the two gases, and I am informed he is chief anesthetist to one of the large hospitals in Cleveland.

Therefore, in view of the situation as herewith presented, it would seem to me that a dentist legally qualified to practice in Ohio, is both legally and morally protected in the administration of general anesthetics, and I trust that if this question comes up in the future, that either specific exception of the dentist be made, or that the Medical Board will prosecute such alleged violation of their law, to the end that our rights may be finally determined in court. Personally, I will admit in advance that I use Nitrous Oxide and Oxygen as a general anesthetic, when it is deemed necessary, and nothing short of the Supreme Court of our state will convince me that I am exceeding my rights.

Respectfully,

H. C. BROWN, D.D.S., Columbus, Ohio.

In the same issue the editor of the medical journal refers to Dr. Brown's communication as follows:

#### DENTISTS AND ANESTHETICS

The letter from Dr. H. C. Brown, on page 149, presents a new phase to the question raised in our editorial on the giving of anesthetics by others than physicians, in the September number of The Journal. Dr. Brown is the recording secretary of the National Dental Association, and formerly secretary of the Ohio State Dental Board, and is therefore interested in the status of the dental profession in the point at issue.

His contention regarding the discovery and the introduction into general use of anesthetics by two dentists must be conceded, and therefore for sentimental reasons this profession deserves certain recognition along these lines. It is a fact also that the training given dental students entitles them to a working knowledge of anesthetics, and the dental practice act gives them the right to employ them for dental operations at least.

We do not believe that the Medical Board had dentists in mind when it passed the resolution referred to in our previous editorial. They are exempted in the medical law when using anesthetics for *dental operations*; how much further this extends we are unable to say. There may be a conflict between the Medical and Dental Practice acts, and if so, this should be settled promptly through the proper legal channels in order to avoid complications.

Our only contention is that the giving of anesthetics shall be restrained to those who have been properly trained in their use, professionally equipped to meet the dangers which may arise, and are legally qualified to administer them.

When the subject of dentists (particularly those specializing in anesthesia) administering general anesthetics for surgeons was brought up,

the medical board asked the attorney general for a ruling regarding dentists' rights under the medical law of Ohio. This opinion is as follows:

*Opinion.*

April 4th, 1912.

Dr. George H. Matson, Secretary The State Medical Board, Columbus, Ohio.

DEAR SIR: Under date of February 26th you submit for my opinion the question of whether or not regularly qualified dentists are permitted, under the laws of this state, to administer anesthetics under the direction of a registered surgeon, or for surgeons at surgical operations.

I assume from the above question that you mean operations other than is incident to the practice of dentistry.

Under date of April 14th, 1911, I have given it as my opinion that administering of anesthetics unquestionably constitutes the practice of medicine and surgery, and that, therefore, it is not lawful in this state for a person who is not a registered physician to administer anesthetics even under the supervision of a registered physician.

While it is true that under the law relating to examination for registered dentists it is necessary that such applicants for license to practice dentistry shall pass a satisfactory examination, among other subjects, on the subject of anesthetics, yet as I view the provisions of said section it relates solely to an examination for the administration of anesthetics in purely dental cases.

Section 1287, General Code, provides:

"This chapter (to-wit: the chapter relating to the practice of medicine and surgery or midwifery) shall not apply to \* \* \* a regularly qualified dentist when engaged exclusively in the practice of dentistry."

As I am clearly of the opinion that the requirements that an applicant for license to practice dentistry in this state shall be examined in the subject of anesthetics applies solely to the administering of anesthetics exclusively in the practice of dentistry, and as I am of the opinion that the administering of anesthetics in surgical operations is a practice of medicine and surgery, and as Section 1287 General Code specifically exempts regularly qualified dentists when engaged exclusively in the practice of dentistry, I am of the opinion that it is not lawful for regularly qualified dentists to administer anesthetics under the direction of a regular surgeon or for surgeons at surgical operations not incident to the practice of dentistry.

Very truly yours,

TIMOTHY S. HOGAN, Attorney General.

In this connection we will add an interesting opinion by W. A. Montgomery, M.D., of the Physicians' Defense Company, Chicago, on the subject. "What gives a man a legal right to administer anesthetics?"

The question has been asked us, What gives a man a legal right to administer anesthetics?

As our answer we will submit to you our opinion, which is based upon the application of general principles laid down in the decisions of various Supreme Courts.

To begin with, when a doctor has qualified under the law regulating the practice of medicine or dentistry, he possesses the technical right to administer anesthetics, but the law does not stop there, but requires in addition to the scholastic education and preliminary instruction given at his college, he must possess and exercise such a degree of skill as is common in similar localities to that in which he is practicing, and further, he must bring into every case that degree of skill, care and competency.

The legal right, then, to administer anesthetics necessarily includes experience to such a degree as to enable the doctor to comply with the rule last stated, and if he does possess this degree of skill and has been duly authorized to practice medicine or dentistry under the laws of his state and brings that skill into a case, and this can be shown by fellow practitioners, he cannot legally be found guilty of malpractice.

On the other hand, all the diplomas and licenses he could haul away in a wagon will not prevent a legal verdict against him for malpractice if he does not possess the

degrees of skill before set forth, and, further, bring to the particular case the requisite care and skill such as is possessed by other doctors practicing in similar localities.

I believe that the statement above made should solve the problem, as the question is asked of me. I might illustrate further by stating that an M. D. has a right to extract teeth, yet if he does not do it properly he might be found guilty of malpractice. A D. D. S. has a legal right to administer anesthetics as much in an operation for a physician or surgeon as for a brother dentist, yet if he fails to do so properly a verdict of malpractice could be obtained against him.

My experience in the past eight years in the defense of physicians, surgeons and dentists has been varied as well as extensive, and that experience justifies the opinion given above. I desire to state that I am giving this opinion based upon the law as applies to such cases, not what might occur to a doctor at the hands of a jury when defended by incompetent attorneys.

It is plain to be seen that experience, ability and proficiency are absolutely essential to protect the doctor from a verdict in a malpractice suit, while they might have no bearing whatever upon his right to practice in a general way, and are only inquired into by the examining board, which issues to him a license, in a way designed to show what his scholastic experience has been, and I wish to draw a strong contrast between the right to practice given by a license and that proficiency which is an additional requirement in a court of law to protect him against an adverse verdict and charge of malpractice.

There are probably few dentists that use other than nitrous oxide, either alone or combined with oxygen, as a general anesthetic, but in the use of this many have become very proficient. The dental profession has developed the use of this anesthetic and made it possible to employ it successfully for long as well as short operations. Dentists have studied and administered it for years and this experience ought to have qualified them to give it for any purpose. But when it comes to the legal aspect of existing laws, medical and dental, governing the use of anesthetics, we find a different phase of the subject.

The field of dentistry has been so broadened that today physicians and dentists have much in common. They should work together for advancement in both professions. They should stand together in obtaining just legislation. If there is any confliction in medical and dental laws in any state, or if any alterations are deemed advisable, the members of the two professions should get together and work in harmony for such changes, as suggested by the editor of *The Ohio State Medical Journal* in the editorial published herein. By living closer together, both physicians and dentists will be benefitted and the general public as well.

It would be interesting to know just how our dental laws are worded regarding the use of anesthetics, and we would like to have either a quotation from each state's law or a copy of the law itself, and in addition we would like to have the secretary of every State Dental Examining Board notify us whether the Board gives an examination on the subject of anesthetics. If our readers in the various states will give us their assistance in this matter it will aid in determining just where we stand in regard to this important matter.



# SOCIETY ANNOUNCEMENTS

## Washington University Dental School Alumni Association

The annual clinic and reunion of graduates will be held under the auspices of the Alumni Association of Washington University Dental School, May 6th and 7th, 1912, at the College building, Twenty-ninth and Locust streets, St. Louis, Mo. (The former dates of April 22nd and 23rd, first decided upon for the meeting, were changed to enable fellow-alumnus, Dr. G. V. Black, of Chicago, to attend as guest of honor.)

This meeting promises to be unusually interesting, both in the way of papers and clinics, and all graduates should make a special effort to be present. All ethical dentists are invited to attend.

R. A. HARRIS,  
E. A. WOELK,  
F. E. MEYER,  
*Publicity Committee.*

## Mississippi Dental Association

The thirty-seventh annual meeting of the Mississippi Dental Association will be held at the Great Southern Hotel, Gulfport, Miss., June 4, 5 and 6, 1912. We invite all ethical dentists to meet with us.

RUSH P. ABBOTT, *President.*  
L. B. PRICE, *Secretary.*

## The Georgia State Society

The forty-fourth annual meeting of the Georgia State Dental Society will be held at Americus, Georgia, June 11, 12 and 13, 1912. Instructive papers have been secured and the clinic committee will unquestionably present a fine list of clinics. A cordial invitation is extended to all ethical dentists.

M. M. FORBES, *Secretary,*  
810-811 Candler Bldg., Atlanta, Ga.

## National Dental Protective Association

The annual meeting of the National Dental Protective Association will be held at the Fredonia Hotel, Washington, D. C., May 21st, 1912, at 7:30 P. M., for the election of trustees and the transaction of business.

RICHARD SUMMA, *President.*  
M. F. FINLEY, *Secretary.*

## STATE BOARD MEETINGS

### Michigan

The next regular meeting of the Michigan State Board of Dental Examiners will be held at the Dental College, Ann Arbor, commencing Monday, June 17, at 8 A. M., and continuing through the 22nd. For application blanks and full particulars address

F. E. SHARP, *Secretary* Port Huron, Mich.

### North Carolina

The next regular meeting of the North Carolina State Board of Dental Examiners will be held in Raleigh, N. C., July 1st, 1912. For further necessary information address the secretary, DR. F. L. HUNT, Asheville, N. C.

**Oregon**

Dentists desiring to make special preparation for the Oregon State Board, in June, write DR. T. W. SHARPE, Dekum Bldg., Portland, Ore.

**Arkansas**

The next meeting of the State Board of Dental Examiners will be held in Little Rock, Ark., June 17 and 18. All applicants are required to pass an examination to obtain a certificate. Examination fee \$15.

E. H. JOHNSON, *Sec'y and Treas.*,  
Citizen's Bank Bldg., Pine Bluff, Ark.

**Wisconsin**

The Wisconsin State Board of Dental Examiners will convene in Milwaukee, at Marquette University, on Monday, June 24, 1912, at 9 A. M., for examination of applicants to practice in Milwaukee. High school diploma, applications and \$25 fee must be filed with secretary fifteen days prior to above date. Dental diplomas to be filed in advance of examination.

F. A. TATE, *President*.  
W. T. HARDY, *Secretary*,  
422 Jefferson St., Milwaukee, Wis.

**Ohio State Dental Society**

COLUMBUS, O., March 20, 1912.

*To the Dental Profession of America:*

The committee appointed at the December, '09, meeting of the Ohio State Dental Society to raise funds to establish an American Memorial to perpetuate the memory of the late Dr. W. D. Miller, have through the co-operation of the honorary committees of the several states, collected funds amounting to \$3,812.50, with an additional \$450.00 subscribed but not paid in at this writing. The amount asked for from the several states was prorated according to the membership of the state societies. Several states have over-subscribed the amount called for, others partially, while ten have failed to subscribe anything.

The proposed memorial will be a monument to consist of a life-size bronze of Dr. Miller mounted upon a granite base, with appropriate tablets, the cost of which will approximate \$8,000, and be a lasting credit to the profession. It is the desire of the committee to have a tablet stating that funds were received from representatives of the dental profession in every state in the Union, and to this end we are solociting funds, whether they be personal or society contributions. Ohio, Dr. Miller's native state, has contributed \$1,400 to the fund, which amount, through personal subscriptions and component societies, will be increased to about \$2,000.

We are asking for a favorable consideration of the matter by the various state societies during the coming meetings, and hope the widespread appreciation of Dr. Miller's work for our profession will enable our committee to take steps toward the construction of this tribute to his memory at an early date.

Dr. Weston A. Price, 10406 Euclid avenue, Cleveland, Ohio, has been selected treasurer of the fund, and to him all subscriptions should be made payable.

Yours very truly,

EDWARD C. MILLS, *Chairman*,  
151 E. Broad St., Columbus, O.  
J. R. CALLAHAN,  
25 Garfield Place, Cincinnati, O.  
S. D. RUGGLES, Portsmouth, O.

**American Society of Orthodontists**

The twelfth annual meeting of the American Society of Orthodontists will be held in Chicago, Ill., Monday, Tuesday and Wednesday, July 1, 2 and 3, 1912.

FREDERICK C. KEMPLE, *Secretary*,  
576 Fifth Ave., New York City.

**The Northern Ohio Dental Association**

Will meet at Cedar Point Tuesday, Wednesday and Thursday, June 11, 12 and 13, 1912. See more extended announcement page 393.

**Reunion Columbus Dental Society**

The Columbus Dental Society will hold an especially interesting meeting in Columbus, Ohio, Tuesday afternoon and evening, May 28th, 1912. The afternoon will be

devoted to clinics, banquet at 6 o'clock P. M., and paper or lecture in the evening by Dr. W. A. Price, Cleveland, on the subject: "Operative Procedures Incident to Conservation and Destruction of the Dental Pulp and Treatment and Filling of Root Canals." Discussion will be opened by Dr. J. R. Callahan, Cincinnati, and Dr. L. E. Custer, Dayton. Members of other Ohio Component Societies are cordially invited to attend.

### South Carolina State Dental Association

The forty-second annual meeting of the South Carolina State Dental Association will be held at Isle of Palms, Charleston, S. C., June 18, 19 and 20, 1912. Dr. R. Atmar Smith, Charleston, S. C., is chairman of the arrangement committee. Programs will be mailed out June 10th. All ethical dentists are cordially invited.

W. BUSSEY SIMMONS, *Rec.-Sec.*, Piedmont, S. C.

### Program of the American Medical Association, Section on Stomatology, for the Meeting at Atlantic City, June 4-7, 1912

1. Oral Surgery and Its Relationship to General Medicine (Chairman's address).....S. L. McCurdy, Pittsburgh, Pa.
2. The History, Object and Success of the Oral Hygiene Movement.....Richard Grady, Annapolis, Md.
3. Wanted: A Sense of Asepsis.....John S. Marshall, Berkeley, Cal.
4. Mouth Cleanliness.....M. H. Fletcher, Cincinnati, Ohio
5. Some Hygienic Errors of Dentists.....L. G. Noel, Nashville, Tenn.
6. The Care of the Mouth of the Sick.....W. C. Fisher, New York City
7. Extra Oral Bilateral Resection of the Mandible, Posterior to the Second Molar for the Correction of Prognathism.....William Harsha and Joseph Eisenstaedt, Chicago, Ills.
8. Acute Osteomyelitis of the Lower Jaw.....W. Wayne Babcock, Philadelphia, Pa.
9. Blind Abscesses.....M. L. Rhein, New York City
10. Infections of the Upper and Lower Jaw.....Frederic V. Hussey, Providence, R. I.
11. The Hospital's Need of a Dental Staff.....Andrew J. Flanagan, Springfield, Mass.
12. The Cubical Contents and Superficial Area of the Maxillary Sinuses.....Virgil Loeb, St. Louis, Mo.
13. The Pathological Findings of Some Diseases of the Teeth and Gums.....Vida A. Latham, Chicago, Ills.
14. Saliva in Its Relation to the Hardening and Softening of Tooth Enamel.....Joseph Head, Philadelphia, Pa.
15. The Reciprocal Influences of Morbid Conditions of the Mouth, Jaws and the General Economy.....M. I. Schamberg, New York City
16. The Speech Relation of Cleft Palate Operations.....George V. I. Brown, Milwaukee, Wis.
17. Iodoglycerole in the Treatment of Bone Infection.....Eugene S. Talbot, Chicago, Ills.

All those interested in this program are cordially invited to attend and take part in this discussion.

STEWART L. MCCURDY, *Chairman*.

EUGENE S. TALBOT, *Secretary*.

### Tennessee State Dental Association

NEW ULM, MINN.

The forty-fifth annual meeting of the Tennessee State Dental Association will be held at Memphis, Tenn., in the Business Men's Club Rooms, June 6, 7 and 8, 1912. The Business Men's Club extends the courtesies of the club to all the visiting dentists, and the association invites all ethical dentists to attend.

CHAS. A. TAVEL, *President*.

J. L. MANIRE, *Secretary*.

### Iowa State Dental Society

DES MOINES, IOWA.

The Alumni Clinic Committee of the University of Iowa has abandoned the annual alumni clinic for 1912. This has been done with the idea of increasing the interest and attendance of the Golden Anniversary of the Iowa State Dental Society. This, together with the postponement of the Midwinter Clinic of the G. V. Black Club of St. Paul, Minn., should double the attendance at the State Society meeting at Des Moines May 7, 8, 9 and 10.



# THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXII

JUNE, 1912

No. 6

## OFFICIAL ORGAN

The Ohio State Dental Society  
The Michigan State Dental Society  
The Indiana State Dental Society  
The Kentucky State Dental Society  
The Louisiana State Dental Society  
The West Virginia State Dental Society

The Northern Ohio Dental Society  
The Northern Indiana Dental Association  
The Eastern Indiana Dental Society  
The Southwestern Michigan Dental Society  
Odontological Society of Western Pennsylvania  
The Lake Erie Dental Society

and Several Local Dental Societies

Editorial Office: 1255 Neil Avenue, Columbus, Ohio  
L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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## VACUUM CLEANING VS. COMPRESSED AIR IN DENTISTRY

By W. C. Dalbey, A. M., D.D.S., Du Quoin, Ill.

SOME TIME ago it occurred to me that I was not getting the service out of my compressed air outfit that I should and that possibly after all I was working along wrong lines; and as there are usually more ways than one of accomplishing the same results, it further occurred to me that probably there were two sides to this question also. Then it came to me, why not try the vacuum way? Everything is cleaned by the vacuum way nowadays! And, too, patients complained of odor from the compressed air nozzle. This was probably due to foul air in the tank from oils or the machinery. If a suction would accomplish the same work, of course this objection would be a thing of the past.

By slightly modifying my tank, by inserting a removable cover similar to a milk-can to facilitate cleaning and a screen of muslin about three-fourths the way up, when the tank was placed upright to keep anything

from entering the vacuum pump and by changing my outlet and inlet tubes and reversing the pumping arrangement, I accomplished it with little trouble; also, the opening of the suction nozzle I enlarged somewhat.

As it is now, instead of scattering the chips or foul debris from a nasty carious tooth all over the patient's mouth and sometimes into my eyes, it is done cleanly, and I do not have to squint for fear of having some of the vile chips reeking with germs thrown into my eyes. By the old method, sometimes some of the chips were blown into recesses and angles all the harder, especially if they were wet. This way every particle is lifted out and drawn away.

We used to talk about dehydrating a tooth by putting alcohol into the cavity and driving it out again with warm air. The only way, in my judgment, to dehydrate dentine or to remove any moisture from the tubuli is by suction, and it is easily done by putting around the nozzle a little unvulcanized rubber to close completely the cavity when inserting the nozzle. And it is a pleasure to see how nicely you can keep a tooth socket from blood and saliva when operating upon that other root you did not get the first time, or when placing medicament after extracting.

By placing over the nozzle a small cup, such as is used in polishing teeth, I am enabled to extract from a fistulous opening any pus found in abscessed conditions. And in placing medicaments in a tooth of this character one is enabled to draw the medicine through the tooth and through the fistulous opening and not get the medicine all over the mouth. In doing this, however, one ought to be very careful to have the cavity sterile and no loose matter around to be drawn through the canals. Also, in an abscessed condition, when no opening exists through the soft tissues, you can, by making a small opening near the lowest point and applying the cupped nozzle, extract very readily any pus present.

Again, my saliva ejector did not work to suit me, so putting a Y into my hose I attached that, but it worked too strong and kept the mouth too dry if anything, so putting a valve between the ejector tube and Y, I instructed the patient to use as desired.

I do not use the rubber dam when inserting gold fillings, cotton rolls or napkins, for the vacuum ejector accomplishes all I desire with ease, and my patient is pleased to escape the dam.

In inflammatory conditions one is pleased to see the results of so-called dry cupping, by puncturing the skin and drawing away a little of the blood from the inflamed area by the little cup before mentioned, thus reducing the inflammation very materially.

Incidentally, with the vacuum scheme I dry my hypodermic needles and throw the wires away. And how nicely it removes the dust from the drawers of my Allen table.

Probably other uses will suggest themselves later. Try it.

## THE TECHNIQUE OF INSTRUMENTATION FOR ABUTMENTS IN CROWN AND BRIDGE WORK AND A FEW SUGGESTIONS IN THE SURGICAL TREATMENT OF CLOSE BITES\*

By S. Marshall Weaver, D.D.S., Cleveland, O.

THE PROPERLY dressing down of abutments in crown and bridge-work is one of the most important operations we have to perform, and, with few exceptions, the most miserably done.

There is no one thing in dentistry that the average man wilfully slights as much as this class of work. To be sure, it is hard work for the dentist and disagreeable for the patient, but we all know if this work is not properly performed the life of the crown or bridge is very short.

Crowns properly fitted and articulated ought to and will last a great many years.

To do this work properly it is first necessary for the operator to have an intimate knowledge of dental anatomy, especially the cross section of the tooth at the cervical neck (illustrate on board). The variation in shape of the different teeth is so constant that this knowledge greatly assists in saving time, a most important factor to every dentist. The writer believes that first of all a man should select a method whereby it is hard to make mistakes, and by illustration I would suggest the hickory form and wire measurement method. This, I believe, is the only method whereby you have got to do the work right or wilfully and knowingly neglect it.

The man who wilfully slights his work needs no sympathy, but the man who wants to do good work and is conscientious, this method will keep him in the right path, for there always comes a time when we are not feeling just right or lose our patience and that there is a tendency to slight the work. (Explain method of hickory stick and wire measure.)

If you decide to crown the first upper molar, for example, you should know approximately, in your mind, what the shape of that cervical measurement should be and start to work systematically to obtain same. The first thing to do is to cut off the end so you have sufficient room for a good solid cusp, for here lies the strength of your work. When you have obtained this start on the sides, which should be started with a leaming disk or a diamond disk under a stream of hot water. With this disk the sides are taken off very easily down to the margin, next comes the corners which is the hard part and the point where most operators fail. Note cut of Mesial Corner Trimmer. How often do you see a square crown on an upper molar. Concave and convex stones are best to remove these angles down to the gum line. You must always be careful not to wound the gingival attachment more than is absolutely necessary.

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\*Read before the Cleveland Dental Society, 1911.



At this stage of the operation there remains a triangular piece of enamel at the gum line yet to remove. To finish the work from this point properly, it is absolutely necessary to have a complete line of enamel cleavers, and don't forget they must be sharp. Cleavers with small handles are



Corner Trimmer, Designed by S. Marshall Weaver.

nearly useless, they should have large angular handles to give leverage and to keep them from turning in the hands. A heavy-bladed cleaver is excellent for checking the enamel (Cut A). This is done with a sharp-pointed cleaver similar to a glass-cutter. The enamel should be started from the top by chipping off small pieces until you get down to the margin, then take the proper cleaver and by keeping under the enamel the remainder is quite easily removed. The main thing is to keep *under* the enamel. A flame-shaped cross-cut bur in a right angle is excellent to do this work, but care must be exercised not to let them slip and injure the gum.

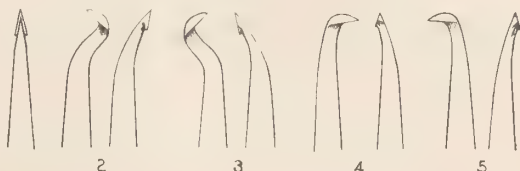


A properly shaped abutment should have its largest diameter just under the free margin of the gum, it should be slightly truncated cone, and whenever the gum has receded the outline of the bifurcation should be carried down through the crown by grooving out the abutment—same as shown in cut of wire measurement. Medium-sized stones should be used in preference to large ones and knife-edged rather than flat.

With a sensitive tooth use a knife-edged wheel and pull it sideways across the surface of the tooth, taking off a thin layer each time rather than a flat-faced one square against the end. If you have not tried this you will be surprised how much easier you will be able to remove the sensitive

portion. In all cases of sensitive teeth use the water as hot as the patient can stand and keep a full stream directed on the stone and tooth.

This also applies when you are using a bur. Try it on yourself if you don't believe it. Of course, all hypersensitive teeth should be anesthetized before trying to dress them down. This is absolutely necessary for perfect work, for there are few people who have the physical endurance to submit to such a barbarous operation and, thanks to the increasing enlightenment of the public, the time is coming when they will demand more for the relief of pain than they have in the past.



A great deal of difficulty is experienced in getting the proper leverage on a tooth to manipulate the cleavers. This difficulty can be greatly lessened by the use of cottonoid rolls.

I wish to mention the preparation of the upper first bicuspid root for porcelain crown. This root, invariably bifurcated, needs a special pin made to suit every case (see diagram.) Please do not use composition pins.

An assistant is absolutely indispensable in this class of work and it is not economy to try and get along without one.

#### THE SURGICAL TREATMENT OF CLOSE BITES

The surgical treatment of close bites is an operation that should be used a great deal more than it is. When a case presents itself where you should have a good deal more room to enable you to get enough material for proper strength and esthetics, why should we hesitate to remove enough of the ridge and tissue to insure a good piece of work? The tissue to be removed has no function, and consequently the patient suffers no loss by such procedure.



It is generally advisable to give an anesthetic so the operation can be done thoroughly.

The technique is very simple. First make an incision extending from one abutment to the other, pass a sharp hook through the middle of this flap and dissect back each way—then with a pair of alveolar forceps pinch off the desired amount of bone tissue. Have a good hoe curette ready to remove the rough points, wash out thoroughly to remove the small pieces

of bone and take a stitch or so if necessary to hold the flaps together. After three or four weeks the case will present an alveolus made to order, and there should be no reason why the operator should complain about not having enough room to make a nice piece of work.

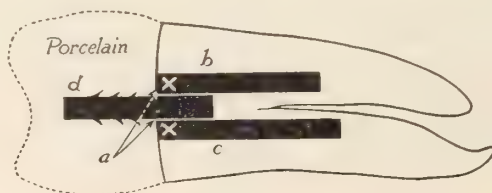
I have given you a few methods and, as far as my ability permits, try to follow them, but do not infer that I have abused my mind and think my work is perfect, but I will say I never spare time, material nor patience in trying to do the best I know how.

There is one other important factor in doing good work, and that is compensation. I frankly make the assertion that the one thing that keeps this class of work from advancing is the cheap prices a large majority of men get.

If the recognized price of bridgework was twenty-five dollars per tooth instead of from five to ten, you would see more time spent on preparation of roots, more material used and more care taken in having the work finely finished.

You cannot fight human nature by trying to persuade yourself that you can or will do the same class of work whether you get ten or one hundred dollars for the same piece of work.

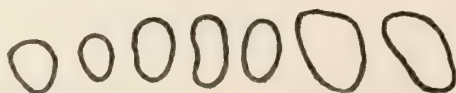
I wish the profession could stop dreaming so much about dentistry being a profession, whose sole duty it is to give their services for the lowest possible compensation and make a living, but instead make our patients respect our ability by charging fees that will make us respect ourselves and by so doing we will feel called upon to do our best all of the time and give every one *value received*, the ideal every dentist should strive for.



A.—Soldered with pure gold.

B-C-D.—Iridio platinum wire square corners slightly dressed.

If crown is *baked*, a piece of 39-gauge pure platinum plate is soldered with pure gold to the end of B and C at X and stamped to fit end of root with orangewood sticks instead of burnishing fit B and C into roots as far as possible and cut off flush with the root, then take a square end fissure bur of the same size as the wire and deepen



between the pins to admit D at least 1/16 of an inch and more, if possible. Now lay on a flat charcoal block in the same relation and solder; to simplify, make a scratch on D where the ends of B and C come, so you will make no mistake.

Please note the typical shapes of roots for the superior left side, especially the difference between first and second bicuspids.



HICKORY STICK AND WIRE MEASUREMENT METHOD OF GETTING THE EXACT SHAPE  
OF THE CERVICAL NECK

When tooth is properly dressed take a dentimeter, and with the wire in position place on tooth just under the free margin of the gum and twist until tight. If this slips off without any traction, the tooth has been properly dressed down, but if it catches at any point the place is easily discerned, for the wire will catch and distort, which must be avoided.

When properly removed, place right side up on the hickory stick. With a *sharp hard* lead pencil the exact outline of the shape is traced inside the wire. Then with a bracket saw cut around the stick as deep as the mark indicates and with a sharp knife split and trim to the pencil mark. (See cut.) When properly done, the wire measure should slip perfectly over the end, fitting in every detail.

Now take the measure for a gold band with a strip of No. 60 tin foil, the same width as band desired, and solder band, then fit this on hickory model, and if properly done should fit the tooth accurately, with the exception of festooning. You also have the stick or the hickory model which will serve as crown holder for filling and polishing and is a great convenience as well as time-saver.

The hickory sticks used are second growth hickory whipstocks, which may be obtained at any hardware store.

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THE GOLD INLAY\*

By E. Ballard Lodge, D.D.S., Cleveland, Ohio.

PROBABLY no subject has been more written about, talked of and discussed by dentists in the past few years than the filling known as the Taggart cast gold inlay; and while that may be true, the writer is confident that the last word concerning it has not yet been said.

Let it be understood from the beginning, that while I am an enthusiast of the gold inlay where it may be indicated, I am no less a devotee of the plugger and mallet.

There is an immense field in dentistry for both kinds of fillings, for both the inlay and the old-fashioned malleted gold filling. Each has its advantages and should be chosen with regard to conditions in each individual case, each case being studied with care and a judgment rendered in accordance with the peculiar merits in evidence.

Where should the inlay be chosen in preference to the gold filling? Answer: In elaborate cases where access is difficult, where a tooth has been weakened in its attachment by preexisting pericemental disease, and where the malleting would involve a large amount of time of both patient and operator if not a great inconvenience and distress especially to the patient, and possibly a great deal of anxiety and nervous force on the part of the operator.

There are some dentists who do not countenance the gold inlay. These argue that in cases where we advocate large gold restorations we should use amalgam or gold shell crowns.

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\*Read before the Stark County Dental Society 1911.

I take the stand that neither should be used if the inlay can be employed, and if the dentist can get an adequate fee for the inlay.

With the writer amalgam is the exceptional filling and is used seldom except in the deciduous teeth, where I regard it as having superior merit, and in cases of persons who, for pecuniary reasons, are compelled to accept the cheaper material.

But let me say here that the idea of cheaper material should not carry with it the thought of cheapness of quality of effort, as, to be successful in the use of amalgam certainly requires a high order of skill and care.

The writer makes a large use of the gold inlay in bicuspid and molar cases, even to cases of badly broken down third molars, believing that he renders a better service in cases where it can be employed than could be attained either by the use of amalgam or by the employment of gold crowns.

#### CAVITY PREPARATION

Just here I must say something on the subject of cavity preparation. Adherence to the scientific principles advocated by Dr. Black should be regarded as essential to success in the use of the gold inlay as in the gold filling.

This preparation involves the four forms, viz: the outline form, the resistance form, the retentive form and the convenience form.

The outline form in proximal cases should be such as will carry the filling well out into the embrasures, thus including the most vulnerable parts of the tooth surface, and reaching into parts of relative immunity to decay.

The resistance form requires that the cavity have a flat base and parallel walls. It ought to be evident to everyone that this is in accordance with the best mechanical principles.

The retentive form implies that the cavity should be so made that it will resist the liability to let the filling come out of the cavity by any cause whatsoever. As there can be no undercuts in the case of an inlay filling, the retentive form is included in the resistance form, the flat base offering safety against thrusts and the parallel walls against pulls. In the latter instance the elasticity of the dentin is to our advantage, as it tends, when walls are parallel, to impinge upon or to grasp the filling if accurately made.

If the foregoing forms are made, the convenience form will usually be provided. By the expression convenience form we are to understand that the cavity is to be so shaped that it becomes easily accessible for proper treatment that a perfect filling may be made.

The neglect of proper convenience form, even at the expense of a considerable good tissue, might mean ultimate failure.

In preparing a cavity for a gold inlay, as for a gold filling, special attention should be given the margins. This is practically included in the outline form, but the cavo-surface angle should receive careful attention.

As for a gold filling, so for the inlay the enamel margins should be beveled for the protection of the short enamel rods. This allows a slight corresponding overlap of a strong material, the gold, to protect the fragile enamel rods at the margin. Here a good knowledge of the histological arrangement of the enamel prisms stands the operator in good stead. As a general rule, the enamel prisms stand at right angles to the surface of the dentin, but there are, as we know, some deviations from this rule.

When fillings fail at the margins it is usually at the gingival margin, hence special attention should be given this part.

Cavities for inlays should be given sufficient depth to admit of an adequate amount of gold, as it should be remembered that gold flows under stress and that in the case of an inlay the melting process has so annealed the metal that it is in its softest state. Only hammering tends to make it more dense. The addition of a small percentage of platinum will render gold harder if it is desired for any reason to have a given inlay receive a special strain.

In the making of inlays, my preference of methods is the indirect; and the artificial stone produced by Dr. W. A. Price of Cleveland is, in my opinion, one of the greatest aids in the production of gold inlays.

Just here let me urge any dentist who has not read the classic essay of Dr. Price, which was read at Denver last summer at the meeting of the National Dental Association, and published in the March number of the *Dental Cosmos*, to do so. It is well worth any dentist's careful thought and study. In this paper he has shown that gold, in changing from the congealing or freezing state to that of normal temperature, contracts 2.2 per cent of its linear dimension. When a tooth to be restored by an inlay requires one which is to extend onto three sides, as for example a molar with a mesio-distal-occlusal cavity, this shrinkage becomes a serious obstacle to an accurate fit unless suitable measures are taken to obviate it. By this contraction the inlay becomes too short mesio-distally, and in the sort of cavity which we usually have the inlay will bind because of this at the axial wall at and near its junction with the pulpal wall. In forcing the inlay to position, unless means are taken to prevent it, there will result a spreading of the inlay at the gingival margins, which makes for failure. Now the artificial stone as developed by Dr. Price, being an unyielding material, prevents the contraction from taking place here and obviates an otherwise misfit at these vulnerable points.

The writer is familiar with the objections raised against the use of the indirect method, but there are several advantages which more than compensate these deterrents to its use. Among these are the ease with which the inlay can be polished, and this accomplished without the annoyance of grinding or burning the fingers and without grinding too much, as is very likely to be done by the direct method. To these advantages we may add that we are assured of a marvelously accurate fit where a true impression has been made and when the other technic has been good.



Do I ever have failures in the use of this method? To say that I never do would make me a candidate for the Ananias club. I do; but luckily, I am beginning to think that I can forecast such misfortunes before much time or labor is lost.

In such cases I am using a technic which combines features of several distinct methods.

All are familiar with the direct method of casting gold inlays, producing a pattern in wax, inserting the sprue, investing, burning out the wax and casting into the mold. The best that can be said of this method is that it is quick and that it enables one to get the occlusal and contact portions readily, accurately and with little grinding.

There is another method of producing gold inlays which some here are undoubtedly familiar with, and that is a method used by Dr. Henry Barnes of Cleveland.

This method consists in the use of a pure gold matrix into which he fuses 22 karat plate gold without investment and without flux. Dr. Barnes uses the Lane blowpipe for this work and he is a recognized adept at this kind of inlay construction.

The reason that this is mentioned here is that I am using the matrix feature in making some of my inlays. To be accurate, I might say that I now employ features of all three methods in a certain class of cases. I do this especially in cases where the cavity extends far root-wise or well beyond the gum, where it is difficult to get a perfectly accurate impression.

Admirable results can be obtained as follows: Prepare the cavity and before sealing with gutta percha and excusing the patient procure an impression in artificial stone. Assuming that it is faulty, it will probably answer for the purpose of approximately adapting a pure gold matrix.

(Let it be understood here that this method is wholly unnecessary when a perfect model is secured.)

No. 36 gauge 24 karat gold is now adapted to the cavity in the stone model. This is annealed and burnished several times until it is a good fit in the artificial stone.

This matrix is now trimmed so that it extends slightly beyond the cavity margins all the way around.

Upon the arrival of the patient for the next sitting the matrix is placed within the cavity and a final adaptation to the tooth itself is made. I find that my double-ended amalgam instruments are very useful in burnishing the thin gold to the cavity margins, and the ball burnishing instruments and gold pluggers are very well adapted for pressing the gold into every part of the cavity. The perforation of the gold will not injure it, Anneal by heating to a red heat in the Bunsen flame. To get the best results it is well to hold down one part while burnishing another.

On being satisfied that the matrix fits accurately it should be removed, dried and filled with Standard inlay wax (the cream colored). This should be in slight excess and the patient should now be instructed to close to get

the occlusion. Being sure also about the contact points, the matrix with its contained wax pattern is now removed, trimmed and modeled, the sprue attached and a casting is made in the usual manner.

This method will insure a good fit even in extreme cases. As for the matter of contraction of the gold, however, I am not prepared to say that the matrix will prevent this. I believe that it cannot; for it is apparent that nothing short of a rigid material, as the artificial stone, can be depended upon to hold it from doing this. However, this trouble can be minimized where it enters in as a cause for misfit by trimming the axial walls slightly at the points where it will be found to bind, as was described earlier in this paper.

In conclusion, the writer believes that the gold inlay is a wonderful advance in dentistry and that it has come to stay. I do not think it a method so easy that any part of the work can be turned over to an unskilled assistant, but that it requires extreme care and skilful attention to every minute detail. But even so, it is a means of greatly assisting our patients and an agency that will enable the dentist to save teeth longer and better and at the same time help to save himself.

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## SOME BACTERIAL AND NON-BACTERIAL DISEASES\*

Eugene S. Talbot, M.D., Chicago.

### BACTERIAL DISEASES

**B**ACTERIAL mouth manifestations furnish a large field for original research which has been neglected for the reason that the physician has been content to leave this line of investigation for the stomatologist. The dentist has been educated along such narrow lines that from his mechanical and commercial inclination and training he is totally unfit for and uninterested in original investigation.

Medical workers in bacteriology are devoted to the general subject and rarely touch on special or local causes and results. Miller's "Micro-Organisms of the Human Mouth" is the only work along this special line with which I am familiar. The researches in this work are certainly well begun, but there is plenty of room for the further pursuit of this subject to confirm or reject previous investigations, to add to the facts already recorded in this pioneer work of Miller and also to take up new investigations where Miller has left off.

Further research is necessary for the purpose of diagnosis and treatment. In most mouth infections, specific treatment may be applied with satisfactory results, while diseases due to remote causes do not respond so readily.

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\*Read in the Section on Stomatology, American Medical Association, of which THE DENTAL SUMMARY is the representative organ for the dental profession, by special arrangement with the *Journal American Medical Association*.

A few cases of mouth infection coming to my notice are worthy of mention at this time. I have had two patients with gonorrheal infection of the mouth; both these patients were traveling salesmen, and while the treatment which was given was beneficial, they left the city before they were entirely cured and the final results were not ascertained.

The literature on gonorrheal infection of the mouth in adults is meager. Dr. W. L. Baum<sup>1</sup> remarks:

Gonorrheal ulceromembranous stomatitis is, according to Menard, always due to profound systemic infection and is always a secondary state. This position was opposed by J. P. Tuttle<sup>2</sup> more than a decade ago, who cited in opposition, among other cases, that of C. W. Culter,<sup>3</sup> in which, in an adult, osculation of a gonorrheic penis was followed in a few hours by a raw, dry feeling in the mouth and in twenty-four hours by the lip vesicles. The gums by the third day were painfully swollen, and on the fifth day the mouth was intensely inflamed. A whitish fluid with a disagreeable odor and taste was secreted. The lips cracked and were covered with herpes; the lip and cheek mucous membrane was thickened, reddened, denuded of epithelium in spots, and in patches covered with a false membrane. Cases later reported by R. Larson<sup>4</sup> were of similar type and origin.

Gonorrhea, a common epidemic in institutions for children, usually assumes the form of ophthalmia, vulvovaginitis and pyemia. In a number of cases of infant pyemia reported by R. B. Kimball,<sup>5</sup> no local lesion was found to explain the entrance of the gonococcus to the general circulation. In Kimball's opinion, the gonococcus may produce a stomatitis, from which a systemic infection could arise. Many conditions of the gums and alveolar process, such as occur prior to pyorrhea alveolaris, predispose to stomatitis, readily forming a culture medium for the gonococcus. Conditions like this in an infant can easily be mistaken for sprue and treated therefor, thus conceding a possible source of systemic infection resulting in pyemia.

Gonorrheal stomatitis, in a case described by Juergens, developed on the gums and cheeks of a man who had recently had gonorrhea. The resultant dirty gray deposit contained the gonococcus.

A horny gonorrheal exanthem is described by G. Baermann.<sup>6</sup> The exanthem was secondary to a severe gonorrheal attack, and was hyperkeratotic in nature. It bore some resemblance to certain tertiary luetic results and to psoriasis. A bacillus was found which resembled the bacillus of the kerosis (xerosis?) group. Baermann is inclined to refer the results to this bacillus, as the gonococcus was not found. It would seem more probable from the results of Woodruff,<sup>7</sup> Baum remarks, that the gonotoxin, which is exceedingly irritating, was the proximate determining cause. The exanthem involved the upper surface of the foot as well as the sole, and was evidently related to the arthritic conditions which appeared in the case.

That the gonotoxin could be drawn to the alveolar process when the elimination is interfered with elsewhere is undeniable. That processes

1. Baum, W. L., in the Practical Medicine Series, 1904, x.

2. Tuttle, J. P., in Morrow's System, 1893, i.

3. Culter, C. W.; New York Med. Jour., Jan. 25, 1889.

4. Larson, R.; St. Louis Med. and Surg. Jour., 1896.

5. Kimball, R. B.; Med. Rec., Nov. 14, 1903.

6. Baermann, G.; Arch. f. Dermat. u. Syph., lxi.

7. Woodruff: Practical Medicine Series, 1902, x.



could be set up similar to the hyperkeratotic states, ascribed by Baum to the gonotoxin, is equally indisputable; still the evidence in my two cases pointed to direct infection. The alveolar process, being a doubly transitory structure and an end-organ with poor vitality, is acted on very quickly and destructively by these germs. The absorption of the tissues is so rapid that the teeth soon loosen and drop out, if the disease be not arrested.

Two cases<sup>8</sup> coming to my notice are as follows:

CASE 1.—*History*.—Traveling salesman, aged 36, unmarried, was sent to me by his physician for local treatment, May 3, 1904. There was a history of gonorrhea with continued urethral discharge.

The mucous membrane on the entire superior alveolar process was involved. The gingival border of the mucous membrane was destroyed and the alveolar process was exposed. Marked inflammation with excessive swelling occurred. Interstitial gingivitis extended throughout the alveolar process, the teeth were loose and sore to touch. The pain was so severe that sleep was out of the question. Salivation was excessive. The raw ulceration was covered with a glazed surface of greenish-gray color. A microscopic examination of a smear from the gums distinctly showed gonococci infection.

Local application of iodoglycerole was used for three days; then the patient left the city. The time was too short for any improvement of the mucous membrane to be noticed, but the pain was not so severe.

CASE 2.—Clerk, aged 45, married, came for consultation. He had contracted gonorrhea twenty-four years previously, and had suffered with gleet ever since.

The anterior superior alveolar process was exceedingly inflamed, raw and badly swollen. He suffered severe pain. Interstitial gingivitis was very profuse through the alveolar process. The incisors were loose, two of which I was obliged to remove. The surface was ulcerated and raw with a glazed surface of greenish-gray color. He had been married eight years; no children. His wife had local trouble, for which she had three operations; he did not know the nature of her trouble. He had been advised by a former consultant to have his jaw removed, because of its cancerous appearance. Dr. Hektoen's examination of the tissue for cancer proved it to be simply inflammatory. I suspected gonorrheal infection. Examination of the tissue proved my suspicion correct.

Applications were first made of iodoglycerole, then silver nitrate. The inflammation subsided in the anterior part of the mouth, but extended rapidly through the vault to the soft palate, which was reached in three weeks from the time I first saw him. On consultation with Dr. Baum, argyrol (25 per cent) was used.

Both these men were apparently in good health, except for slight rheumatism. Both seem to have been infected by the fingers as an intermediary host of the gonococcus.

#### SPIRILLA INFECTION

CASES 3, 4 and 5.—Three patients with spirilla infection were most interesting. Mr. G., aged 30, just married; Mr. C., aged 31, unmarried, and Dr. DeC., aged 28, unmarried. The histories were alike. The mouths were very much inflamed, especially the gums. The gum festoons were very much swollen and ulcerated. Most excruciating pain on touch; teeth loose. The appearance of the gums was not unlike those mentioned before in the gonorrheal infections with the dirty gray appearance but the isinglass appearance on the surface was not present. A microscopic examination of each showed spirilla and spirochetes, though the spirochetes did not have the character of *Spirochita pallida*. Mixed pus cocci was present in all; one had pneumococci. Blood and pus were present in each patient. Staphylococcus emulsion was made of cultures from the

8. Talbot, E. S.: Internat. Dent. Jour., April, 1905.

pus on gums. One drop contained 20,000,000 killed bacteria. The emulsion was injected into guinea pigs with negative results. Since spirilla mouth infections are properly due to uncleanness, a removal of the filth deposit around and between the teeth and a local application of a 20 per cent solution of argyrol healed the tissues in from one to two weeks.

#### APHTHAE

Aphthae were supposed to be the result of impaired digestion. When these ulcers made their appearance in the mouth, it was thought the stomach secretions were in an abnormal condition. They may be located on any part of the mucous membrane of the tongue, gums, cheeks or lips. Sometimes they are the size of the head of a pin, and in one instance coming under my notice, the entire mucous membrane of the mouth was covered. They are usually started by the irritation of a tooth brush, tooth-pick or any foreign substance causing irritation. The germs already in the mouth infect the part and the ulcer is formed in twenty-four hours. I have produced aphthae ulcers in cleaning the teeth and massaging the gums. These ulcers usually occur on the mucous membrane of the cheeks and lips by accidental injury to the parts with the revolving brush.

I have seven patients in my practice who are subject to these patches, and I have produced them by irritating the part with the revolving brush in cleaning the teeth. Some patients seem to be susceptible to special germ accumulation and infection. These ulcers are treated successfully by the use of silver nitrate, but a better and less painful method is the use of 20 per cent argyrol, which acts quickly and successfully.

#### NON-BACTERIAL DISEASE

##### INTERSTITIAL GINGIVITIS OR SO-CALLED PYORRHEA ALVEOLARIS

A disease which the stomatologist is called on to treat many times each day is that of interstitial gingivitis. The term "pyorrhea alveolaris" was given the disease in 1880 by Dr. Rehwinkel of Ohio, because in a few patients pus was discovered about the necks of the teeth. This term "pyorrhea alveolaris" has led many a good man astray. That there are a few patients with infection of the gums, all will admit: some of these have already been mentioned. These infectious diseases can easily be differentiated from the ordinary interstitial gingivitis patients so common in practice. The disease presented us many times each day, however, has not been shown to be infectious. Research work has been done by many scientists, Galippe,<sup>9</sup> Miller,<sup>10</sup> Rhein, George T. Carpenter,\* Sudduth\* and myself,\* none of whom has been able to show it to be a germ disease. It may be possible later to demonstrate infection as a cause. My own researches\* have shown that the interstitial gingivitis is due to an irritation of both a local and a constitutional nature. These experiments have been made by every conceivable method on human beings and animals. I admit that

9. Galippe: Die Infektiöse Artho-Dentaire Gingivitis, 1884.

10. Miller: Microorganisms of the Human Mouth.

\* Interstitial Gingivitis or So-Called Pyorrhea Alveolaris.

when pyorrhea is present, pus infection has taken place, but only about 10 per cent of patients are so infected. This condition, however, is always secondary to the primary disease. If my views should prove to be correct, the opsonic and vaccine methods of treatment are certainly not in harmony with proper methods of treatment, and much time and labor has been wasted. The local use of iodine and the sulphocarbolates by the operator and a stiff brush by the patient, with proper care of the general system, will cure all interstitial gingivitis and pyorrhea patients, if undertaken before the teeth become loose.

As I stated at the outset of this paper, more original research work is necessary before a proper course of treatment can be given.

31 North State Street.

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## HINTS

By Dr. L. C. Holland, Suffolk, Va.

Those who use Melotte's metal for dies I dare say frequently have trouble in procuring a good die on account of either pouring the metal too hot or too cold, or from burning the bismuth from the metal.

To get a good, sharp die at all times, pour your metal (I use a rubber ring in which to pour it) and just before it hardens press firmly down on the metal with a glass pestle about the size of the rubber ring. The die will be smooth and free from bubbles.

Those who make their own local anesthetic I suppose are using about 5 gr. of cocain to make 1 oz., since this is the quantity generally used by most dentists. After testing various percentages used for extracting, I find that you can cut the amount of cocain down from 5 gr. to 2 gr. and even 1 gr., and get the same results with less danger of a sick patient.

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## CONCERNING DOWEL CROWNS

By S. H. McAfee, D. D. S., New Orleans, La.

AS A PROLOGUE to this more or less disjointed discourse I would say that I am afraid it contains nothing specially new, original or interesting, it being a recitation of personal views and beliefs to which experience and observation have brought me regarding dowel crowns. Should there be any discussion I will be glad to have you differ with me as radically as you please, as it is by the discussion that the essayist profits most.

When I started in practice, some twelve years ago, the ready-made porcelain crown, with the baked-in platinum dowel, was to me the ideal crown for the ten anterior teeth. But after a while I began to realize that it was not often I could find what I thought was just exactly the right shade and shape. Then, too, I found that it was impossible for me to grind

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\*Read before the Louisiana State Dental Society, 1911.



an ideal adaption between porcelain and root, getting the dowel well up the canal without excessive reaming. Ultimately I concluded that it was impracticable for me, in the majority of cases, to attain even a mediocre result with any reasonable expenditure of time and effort. This I attributed to my lack of skill, as I had seen many pictures in text books, journals and catalogues showing the operation very beautifully done. So I abandoned the grinding method and tried fitting disks between the root and porcelain base, and filling in with solder; but this method presented the serious objection of subjecting the porcelain to heat.

The so-called Richmond and Morrison crowns present several objections; again requiring the heating of the porcelain facings, subsequent change of color due to leakage between the metal back and porcelain, opacity or dead look due to the metal backing, necessity of objectionable protecting edge of gold where maximum strength was necessary, etc.

A few years later I became interested in porcelain work, using facings soldered to platinum frame work and building in with porcelain body, the easiest method of all. Subsequent experience convinced me, however, that it was the very poorest and most unreliable of all, so I abandoned it altogether.

After this I began using the tubular backing detachable method, and while much more reliable and satisfactory in several ways than any method I had used so far, it presents some objectionable features, especially for individual bicuspid crowns, the occlusal area having to be of gold. And while I still use this method exclusively in bridge work and occasionally for an individual crown, I have adopted the *swaged* double coping, using the detached Twentieth Century, Davis, or detached porcelains, cemented first to the coping and then to the root.

I never put a porcelain tooth through the fire unless it be to bake on a stain for the purpose of changing the shade in extreme cases, and I don't like to do even this, so opposed am I to heating porcelain teeth.

A modern text-book on *Crown and Bridgework* says: "Perhaps paramount among the difficulties is the checking or fracturing of porcelain facings, and while seemingly unavoidable, is in nearly all instances due to *flagrant negligence*," etc.

Some writer in a recent essay says: "There are three kinds of men who never check pin teeth; one who has bad eyesight, another who has little regard for the truth, and one whose practice doesn't give him a chance."

Opinion will perhaps always be divided on this question. But the operator who practices subjecting his porcelain teeth to heat has a percentage of failures that could just as well be eliminated. Make it as *strong* as possible the *first* time and then cement it on to stay, is a good motto in C. and B. work.

With the advent of the casting process I tried various methods of forming copings with wax, casting them to the porcelain; also casting

them with porcelain removed, but my general average of success, considering perfect adaption, time spent and subsequent breakage, was so low that I abandoned it altogether, except for now and then an exceptionally favorable case, and returned to the swaging method, using soft platinum and platinum solder and the oxyhydrogen blow-pipe in the initial steps.

Some of the advantages of this method may be stated as follows:

First, you can make a dowel and coping for the root that you know either does or does not fit, before you go any further. The more irregular and unfavorable the gingival outline and root end, the more reason for using this method. A band on a root, with a very irregular gingival outline, does no good; in fact, it is worse than useless. The labial half of a band on any of the upper anterior teeth adds absolutely no strength to the crown or root and is in every instance a positive detriment, sooner or later provoking recession of the gum. A partial band at the lingual side of the root, made by swaging up the edge of disk, is often advisable as it serves to make the lingual half as well as the labial half of the root carry the labial stress of mastication. To do any good on the lower anterior teeth it would have to be on the labial side of the root, but, of course, it wouldn't do to put it there. However, lower root-ends as well as the uppers may in most cases be beveled so as to prevent splitting stress, also rotation stress.

The root dowel and coping being wholly independent of the porcelain portion, the dowel can be made to follow well up the canal without excessive or convenience reaming, regardless of the direction of the canal in its relation to the porcelain and the position of the dowel hole in its base.

How often do you find a root in which the direction and position of the canal corresponds with the hole in the porcelain closely enough to allow the use of the one-piece dowel? I don't often find them.

The root dowel and coping being separate allows free alignment of the crown on the root, the two being joined later by solder. The soldered joint is much more reliable than the cast joint. The technique of swaging the copings and joining them with solder I have found more reliable than casting, all element of chance and haphazard being eliminated.

The detached porcelain crowns are more translucent and lifelike than any other form. They may be ground and polished on any surface and are sufficiently strong if well seated in the coping. The fact that the incisal, or occlusal, or any of the surfaces, may be ground and polished to meet the requirements even after the crown has been set, is also often a great advantage. The absence of any metal on the incisal or occlusal surfaces being perhaps the strongest point of all. I never hesitate to grind a crown or facing to give it more harmonious lines. They should, of course, be thoroughly polished afterwards. Grinding the labial surfaces usually darkens the shade a trifle.

The technique I employ in making a crown of this character may be briefly stated as follows:

First, the canal should be managed and filled throughout its entire length, just as though no dowel was to enter later. And it should be filled with something that gets hard and solid and remains at least air-tight at the apex. Agate, a slow-setting oxychloride of zinc cement, followed with a gutta percha canal point which loosely enters the canal and goes to or near the apex, is what I use. A Kerr broach or reamer will subsequently follow the gutta percha point to the required depth, and what remains beyond will be root filling. A canal so filled should not be reamed until the cement has had time to harden; otherwise the gutta percha point will be twisted out and the apex sealing spoiled.

None of the mushy abscess-cure canal filling materials which do not thoroughly harden are, in my opinion, suitable for sealing a canal to be entered later by a dowel.

If you are sure you can always pack air-tightly a small piece of gutta percha just at the apex without pushing it or anything else through the foramen, there would be nothing better. But if you should fail to get it ideally placed, only *thinking* you had it there, I know of nothing worse.

Having reamed the canal, always using a tapering reamer, one with a point that will not go where there is not already a canal, or something soft, like a gutta percha point—it should be a reamer, not a drill, nor a drill-reamer; otherwise some time in your life you are sure to perforate the side of a root—I usually fit on a temporary crown. This is made by roughly grinding in most any old facing or plain tooth, waxing it to a piece of german silver wire, adjusting on the root, investing and soft soldering.

This may be set with temporary stopping; is easily removed from time to time, serves the purpose of looks for the time, and, best of all, keeps the gum pushed away from the end of the root, greatly facilitating subsequent work on the crown and its final setting.

If the apical foramen is not properly sealed beforehand there is great danger of causing trouble by pumping air and other things, perhaps, into the tissue beyond, either in setting a temporary crown, or in cementing the final one.

A long tapering dowel by all that's good and holy! There is every mechanical and technical reason for a long tapering dowel as opposed to a straight plunger-shaped one, or a short, large screw-shaped one, as suggested by some. The tapering dowel fits when it gets to place, but not before; therefore, allows easy egress of surplus cement and lessens liability to confining air in the canal. It has strength where it is needed and does not call for unnecessary reaming in the apical region, with its consequent danger of perforation in thin roots.

A long, rigid, tapering, smooth dowel, larger, of course, but following the natural outline of the canal, is the best insurance against root-splitting.



I know of no better way of making dowels than to file them out of 12, 14 or 16 gauge round, iridio-platinum wire. They cost a few cents more than other kinds, but if we would tell the patient the real truth about them, would they not always be willing to pay the difference if necessary? It's like the sharp bur proposition—"Pay me 8 cents more and I will use a brand new sharp bur on this sensitive cavity." Would not the patient be only too glad to do it, if necessary, and if given the chance?

Most all tools that are set in wooden handles have a tapering shank going well up into the handle to give maximum fixture, and so guard against its coming off or splitting the handle. They also usually have a ferrule which fits smoothly and tightly, it being *driven* on. If the ferrule were constructed from a wire measure and made loose enough to be pushed on and off several times and finally "squashed" on with cement, it would offer little protection against the splitting of the handle. So it is with short post, banded crowns.

I can seldom use a root facer for shaping the end of the root. They are usually too large or too small, will wound the gum in spite of being—as some are called—safe-sided. I cut down the root end approximately with a stone, then with a sharp No. 4 or No. 5 round bur I cut away the labial aspect, leaving the enamel edge standing around the periphery; this I carefully trim off with some of the Black's set of enamel trimmers or chisels. This may all be done without wounding the gum. After reaming the canal and fitting a dowel I take a small piece of 38 gauge, well annealed soft platinum to form the disk, burnish it lightly to root end to show position of canal; holding it in position, punch a small hole with a sharp round-pointed instrument: in this hole place the tapering dowel and force it home. The taper of the dowel further enlarges the hole in the disk, makes the two hold together in juxtaposition till joined with solder. I use platinum and platinum solder because they are easier to work, do not oxidize, no borax or flux being needed, and cannot be burned in subsequent soldering. Platinum solder requires the O. H. B. P., but by substituting pure gold for solder the ordinary B. P. will do.

I find platinum much easier, quicker and safer to work, and it costs only a trifle more. Having soldered the dowel and disk, return to the root and swage it down and trim till it fits. I find Black's Amalgam instruments, Nos. 1 and 2, useful here, using them in a pushing and swaging manner rather than rubbing or burnishing. The serrations keep them from slipping off. With one hold the dowel firmly in place, and with others the swaging and crimping of the disk over the lingual root end is easily accomplished. Of the two faults, to have the disk or coping smaller in circumference than the root is the lesser evil; if larger, it forms a shelf for debris.

Having roughly outlined the disk to the root, flow a little 24 karat or 22 karat nonoxidizable gold over it around the dowel, extending toward the periphery. This will facilitate the final swaging of the periphery and insures against change of shape in handling.

Leaving the lower end of the dowel still long, take a plaster impression, first placing a thin diaphragm, notched and stuck to the dowel end. For this purpose I use thin phosphobronze; select a Davis crown and grind to an approximate fit on the cast, cutting away as much as can be spared at the lingual aspect. Also, cutting away the lingual circumference of the porcelain until it is less than that of the root, so as to allow for some gold to be run up over the crown part of the coping. The porcelain should be made to touch the root at the labial aspect, beveling or cutting away the copings just at that point, and great care should be exercised to keep this union under the gum. To make the coping for the porcelain I sink the crown, incisal edge down in a ring filled with impression compound to facilitate holding it and make a coping for the base of it in a manner very similar to the one for the root. The swaging press is useful here, letting the coping come well down on the lingual side to form a cup. Both dowels are now cut off as close as possible as you usually need all the room you can get between them. The pieces are assembled on the model with wax, tried in the mouth, invested and soldered. Cement the crown to the coping and place a rubber dam clamp on it to keep it under pressure until the cement sets. After cleaning it up and doing the final polish it is ready for cementation on the root.

I have purposely omitted superfluous details because we are all familiar with the general principles of this method, and I am not putting it forward as anything new, but am simply briefly stating the method to which experience has brought me so far as giving me the most satisfactory results, time and effort considered. There are, however, many cases to which this method is wholly unsuited.

## OVERCOMING DISTORTION OF A BRIDGE DUE TO SHRINKAGE FROM SOLDERING\*

By S. S. Grosjean, D. D. S., New Orleans, La.

**I**F IT were not for the eccentricities of metals upon cooling after being subjected to high heat, our course in bridge construction would be facilitated, and upon insertion our labors greatly lessened.

Not only the noble metals, but the base ones as well, are governed by the same laws—i. e., when heated they expand, and upon cooling they contract.

To the workers of the base metals these physical facts cause much anxiety as well as serve a very useful purpose. They are, however, better equipped in their field to meet these contingencies than we are. Iron and its allied metals have been tested under all varying conditions—size, heat and cold, and from the data collected tables have been computed with such accuracy that a foundryman has no difficulty in producing a casting of any size desired.

\*Read before the Louisiana Dental Society, 1911.

With us there are no tables to compute the shrinkage of the noble metals, and if we had them they would be of no practical use, since the construction of a bridge is such that scales or rules would not be applicable. We cannot always foretell our results, and in the majority of cases our work is in the dark and our trust is in luck. Yet our work is of such a character as to require an accuracy that will look well under a microscope.

If gold did not possess the property of shrinking after being fused we could very well do without it. Since we cannot prevent its shrinking, nor can we compute the amount of shrinkage that will take place in any or all directions, necessarily means must be provided to cope with this disturbing factor.

The primary step in overcoming this discrepancy lies in the foundation of the bridge—i. e., the proper preparation of the teeth or roots which are to form the abutments. They should be parallel in alignment with each other. If it be impossible to make them parallel, sufficient taper should be given the root canals, if dowel crowns are to be used, so that upon insertion of the piece the small end of the dowel having a large hole to enter is more readily started, and the pressure upon the roots by the dowels causes them to slightly move to conform to the alignment of the crown, thus bringing the bridge to place.

If shell crowns are to be used the crowns of the teeth should be tapered so that the crowns will take hold and force into position.

In soldering bridges as a whole when the backed facings have been invested, care should be taken in backing the facings so that the backings extend well across the facings and are allowed to touch their neighbors.

Should there be spaces between the backings—that is, interproximal spaces, and the porcelains remain touching, the contraction may be such as to crack them. Particularly is this so if the piece is more or less straight. If it be arched the contraction will be toward the center of the circle and this would tend to prevent the facings being drawn together and lessen the danger of cracking, but the distortion of the bridge would probably be worse than the cracked facing. The possibilities of ill results attendant upon this method are so great that it may well be relegated to the past.

A better method is to construct each individual abutment and dummy separately. Should there be two or more dummies together, join them first, then replace upon the model; this will lessen the points to be soldered when the whole piece is invested. The crowns and dummies should be made of a higher fusing metal than the solder to be used for completion. This prevents the fusing of the built-up portion and confines the shrinkage to the lower fusing metal.

After assembling the crowns and dummies upon the model, should there be any space between the parts to be joined, a piece or pieces of plate gold the required thickness should be forced between these parts to prevent them being drawn together after soldering.



Should the bridge be large, consisting of three or more abutments, it should be constructed in sections, these sections assembled in the mouth and another impression taken.

By doing this a better relationship of the parts is maintained and the points for soldering reduced to one or two. In bridges of this character the crowns and dummies should be built up of an alloyed gold fusing above 20 karat solder, the section joined with 20 karat solder and the final joining of the section done with 18 karat solder. This allows the final soldering to be done with a solder sufficiently low in fusing to prevent the refusing of that previously soldered.

To avoid the cracking of facings, that may be due to the contraction of the metal, the methods whereby the facings are not put through the fire are unquestionably the safer. Such methods are those employing Steele's Detachable Facings, or backing the facings with inlay wax, drawing them from the wax, and casting the backings, the facings being subsequently cemented to the backings after all soldering is completed.

The latter method possesses distinct advantages, inasmuch as it is possible to definitely determine the amount of metal necessary, the exact shape of each individual piece is ascertained and preserved, and after the backings have been cast they may be handled, added to or taken from for readjustment as the condition may require. Finally, they may be assembled with an exactness that will require a minimum of solder for joining, and this evenly distributed in the approximal spaces reduces the distortion to a minimum.

A factor that by far plays no mean part in the controlling of distortion is the investment material. It therefore behooves us to select one that will remain as near neutral as possible under all conditions.

The whys and wherefores of investment materials would form the subject of a paper itself. At this juncture it is only intended to call attention to the fact that they do exert an influence upon the shape of a bridge by their changing shape while being heated, and that those whose ingredients are made up of coarse particles of a refractory material and having a small percentage of plaster, serving only as a binder, give the best results.

Stamp Courtesy firmly and clearly in your hat, young man.  
Use it much, and you'll find it will carry you a mighty long way.

—John Emery White.

## ASEPSIS AND STERILIZATION IN DENTAL PRACTICE\*

By L. D. Archinard, D. D. S., New Orleans, La.

**T**O PRACTICE aseptic dentistry is impracticable, if not impossible, but to sterilize instruments after using requires no especial knowledge or skill. It does, however, call for moral backbone and for character of the highest type.

A high moral standard has always been an essential to dental practice, but never has the advice of Polonius, "To thine own self be true," been more applicable to the dental profession than since the advent of bacteriology made the sterilization of instruments a responsibility from which we have no right to shrink.

We know, and have known for years, of the possibility of transmitting the germs of syphilis, of tuberculosis, and of other diseases by means of unclean instruments. We have known of the ease with which pus-producing forms can be carried on the mouth-mirror and instruments, and by the hands.

We know that the cotton with which we have wiped out an abscess, or which we have taken out of a suppurating tooth, is often left on the table or falls upon the floor, and we know that in its meshes are perhaps millions of staphylococci, and perhaps streptococci, capable of giving rise—under suitable conditions—to abscesses of a serious nature.

We need not be told that the mouth-mirror should be sterilized whenever it comes out of a patient's mouth, and before it is used for the next examination. Our conscience pricks us every time we rinse it off and wipe it, and say, "I guess that's clean," for we know that we have taken a chance of introducing some germ into the patient's mouth that was not there before. All this knowledge has become so familiar that we deem it almost commonplace. All of us believe and have firm faith in the doctrine that many diseases are occasioned by living micro-organisms that usually find their way into the body through the mouth.

How comes it, then, that a large body of educated men, many of whom have received special instruction in bacteriology, should be careless in their application of asepsis to their professional work? How is it that a body of men, as represented by our profession, who probably put forth more conscientious, painstaking labor in the course of the average day than any class of men in any profession, should fail to include in their high moral code a practical plan for the sterilization of instruments?

How is it possible for a man with well-developed moral fibre, such as most dentists possess, who is honest in every detail of his work, who is constantly sacrificing his own convenience and giving his strength and health for the good of mankind—how is it possible, I say, for such a man, knowing what bacteria are, how they may be transmitted, and what evils

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\*Read before the Louisiana State Dental Society, 1911.

they may produce, and, knowing, too, how to prevent these evil results—how is it possible for any dentist to neglect any precaution that will protect his patient from the remotest possibility of infection?

It does seem strange that there should be a single dentist left who does not take the precaution necessary to protect absolutely his patients against contamination, but I am afraid we must admit that many of us are guilty of occasional sins of omissions.

Do not misunderstand me: I am not here to berate the profession, nor to bring accusations of neglect of duty. I am trying to picture the condition of affairs as I see it today. Let us be honest with ourselves and admit that the picture is not greatly overdrawn, and let us seek the explanation. The average dentist is an eminently practical person. Show him a way by which he can improve the condition of his patient's mouth, and no consideration of self and no thought of the trouble involved will prevent his adopting that method.

In the matter of asepsis the busy dentist has many excuses for not being greatly impressed by the necessity for sterilizing his instruments, and when all things are considered it must be confessed that the number of known cases where infection has been carried by dental instruments is comparatively small. We know that, as far as septic infection is concerned, the mouth, owing to its enormous blood supply and the abundance of leucocytes in the tissues, is more resistant than any other part of the body. This is not due, as many suppose, to any antiseptic property contained in the saliva itself. There may, and probably do exist in the mouth secretions, many non-pathogenic bacteria that excite the leucocytes to action and in this way protect wounds from pathogenic or pyogenic micro-organisms.

This probably explains why animals lick their wounds. Human saliva not only has little retarding action on bacteria, but acts as a very good culture medium for many forms. If it has any power to protect against the inroads of disease, that power lies in the non-pathogenic bacteria which it contains. We have been accustomed for generations to perform, and to see performed, operations in the mouth which, if undertaken in any other part of the body without aseptic precautions, would result in abscess, septicemia, or lock jaw.

Suppose you make such a wound in the foot, leg, or arm, as is ordinarily made in the mouth by the extraction of three or four teeth, what would become of the patient if it were allowed to fill up with all sorts of foreign matter and remained untreated? It would naturally result in an unprecedented boom in cemetery lots. Yet we see these great excavations in the mouth, ragged edges of gum tissue, fractured alveolar process, all caused by the extraction of a tooth, and all healing without the slightest treatment or the least suggestion of cautionary measures. Food particles fill up the wound; armies of bacteria flourish, multiply, and die; all the fluids of the mouth find their way in and assist in maintaining an active process of



fermentation or putrefaction; and yet, even in the filthiest mouth, after extraction by the dentist, using the filthiest instruments, we are bound to confess that serious results seldom follow such operations.

I am not pleading for lack of cleanliness, but I wish to be fair, and to show why dentistry has not pinned its faith to aseptic operations, as surgery is obliged to do. We have not felt the necessity, and we are practical enough to know that the risk is not really very great if we do not strictly sterilize our instruments after each patient.

We know, too, even if it has not been carefully explained to us, that the great safeguard against bacteria, the impenetrable wall, against which the germs of disease may dash themselves in vain, is sound, healthy and unbroken epithelial tissue.

Whether it be in the mouth or upon the surface of the body, healthy epithelial tissue forms an impassable barrier to all forms of bacteria. We know, however, that while this is a safeguard to be trusted, it is not to be fooled with, for we know that blood-poisoning frequently follows a wound too small to have been noticed, nor can we ever be sure that in the mouth the epithelial covering is not broken or congested and ready for the admission of bacteria.

On the whole we have reason, I think, for believing that in view of the vast number of dental operations performed, the evidence that can be gathered would hardly show any great number of cases wherein disease has been carried by dental instruments: and it is for this reason, and for other reasons I have alluded to, that the practical dentist has not shown an active interest in the lessons bacteriology teaches, and has failed to seize with avidity the idea of absolute protection to his patient by means of sterilized implements of practice.

Nevertheless the idea demands our respect, and the knowledge we have acquired in the past quarter of a century in relation to the transmission of disease by bacteria places upon us a responsibility so grave, so sacred, that to neglect it is scarcely less reprehensible than to become a contributing party in a case of manslaughter.

Do not let us shirk this responsibility, but let us face it with the will and power which have characterized all advances in our profession. Have we not a right, in view of our present knowledge of bacteriology, to regard the surgeon guilty of manslaughter who contributes to the death of a patient by using an unsterilized knife?

Let us bring this home to ourselves. Can we ever be sure, in using an unsterilized instrument, that we are not conveying a disease germ to our patient's mouth, and can we be sure that the germ so conveyed will not find the conditions ripe for its development and for the propagation of disease?

Are we, then, justified in taking the risk of introducing that micro-organism into the mouth of our next patient by a failure to sterilize that instrument? I pause for a moment that you may ponder over this question, because it is not idly asked.

Now, as to how to sterilize the instruments. My methods are simple and familiar. Let us say that we are through with an operation, and that the next patient is waiting. First, let the dentist wash his hands so as not to contaminate everything in the office that he may touch between patients, appointment-book, pen or pencil, and many things which he is sure to touch, and which, if touched again, will infect his hands. While he is doing this let the assistant quickly remove the things from the bracket-table or instrument stand, and proceed by first washing with running water to remove blood, debris, etc.; then placing all together in the sterilizer where they remain boiling in water, to which a pinch of bicarbonate of soda has been added to prevent rusting, for ten or fifteen minutes, or more, if they are not required—and they usually will not be—except the mouth-mirror, pliers, explorers and a few spoon excavators, and these have to be duplicated. Dentists, as a rule, provide themselves with enough burs for this purpose.

In all ordinary operations upon the teeth this is quite sufficient. We may as well give up the idea of strictly aseptic dental operations because we cannot possibly sterilize the mouth, and the moment an instrument enters it becomes contaminated. The public, however, has a right to expect security against the mouth bacteria of others. Our patients are only reasonable in demanding that they be not exposed to the germs contained in the mouth of the patient that preceded them, and it is our business to insure them this immunity: but to obtain a strictly aseptic condition of the mouth is beyond the limit of our skill. I know of no method of destroying the bacteria in the mouth that will not also destroy the patient.

I use antiseptics in all cases where suppuration occurs, and am convinced that they do an immense amount of good, but I have never been able to get a perfect aseptic condition, and I believe that no one has; nor am I sure that it is desirable that the mouth should ever be sterile.

I am proud to be able to say, in closing, that in the dental department of Tulane University effective measures are being taken for the sterilization of instruments, and every student at that college has impressed upon him the necessity for the thoroughness in this particular.

The public is beginning to appreciate this necessity and is demanding, in no uncertain voice, protection at the hands of the dentist, and the lag-gard dentist who is content to take his chances and run for luck will find himself supplanted by the men who understand their moral responsibility and have backbone and determination enough to practice with clean implements, clean hands and a clean conscience.

**“A few minutes’ head work will often save several hours’  
foot work.”**

## CHILDREN'S TEETH \*

By F. A. Keller, D. D. S., Garyville, La.

SOME dentists have built up large practices by their success in handling children. To be able to successfully operate for children requires such tact and policy, together with patience and endurance as all men do not possess. Children come to the dentist with such fears of ill-treatment that it is difficult and sometimes impossible to convince them that something awful is not in store for them. This is largely due to the fact that the grown members of the family are in the habit of discussing the operations of the dentist with many expressions of horror and apprehension. The visit to the dentist is made much of and extravagant statements are made concerning the amount of pain inflicted and the length of time consumed in performing the work. Frequent references to "kill," "hurt," "dead," etc., are not likely to inspire a child with confidence or to make his prospective visit to the dentist hold out any great attractiveness. People will never cease to look upon the dentist in the light of a necessary evil, and they will continue to discuss his painful operations in the presence of children until the time comes to take the children to the dentist, and then the attempt will be accompanied with familiar vocal selections, but not productive of pleasurable appreciation. Children are most successfully dealt with by having them come on one or two appointments with one of the older members of the family who may be having dental work performed; in this way the child is accustomed to the surroundings and is made aware of the fact that the dentist looks just like any other man and does not appear to have any special desire to annihilate him on sight. He also observes that the one for whom work is being performed is not being hurt very badly, and when the time comes for him to have his own work done the dentist will have won his confidence to such an extent that he can be seated in the chair and the simplest operations performed at once without inconvenience to child or operator. Long operations are fatal to success with children: the work should be divided so that it does not take more than one-half to three-quarters of an hour to an appointment.

Most operators favor the use of plastics in children's teeth — altogether in the deciduous teeth; these are intended for temporary use and therefore demand only temporary fillings, such as cement, or cement mixed with amalgam, and are thus saved until the appearance of the permanent ones, which is all that is necessary. After the eruption of the permanent teeth frequent examinations should be requested and the filling material will, of course, be indicated by the quality of the tooth structure.

Opinions differ somewhat as to the age at which gold may, with propriety, be inserted in the teeth of children: 12 years seems to be the lowest

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\*Abstract of lecture given before the Louisiana State Dental Society, 1911.



age at which it is considered proper by good dentists, and 15 years appears to be the age at which it may be used in nearly all cases. The circumstances of the constitutional condition of the patient and the quality of the teeth affect a decision in the matter. Considering the rapid growth of children between the ages of 12 and 20, and the extensive decay which supervenes upon rapid growth, it would appear to be the part of wisdom to use that which experience has determined is the best for the purpose it is intended to subserve and that can be inserted with the least pain.

To properly control children so that they will appreciate dental service and be at all times ready to conform to the rules which apply to grown persons in the matter of attention to the teeth is a very great advantage. Thus the appointment cards should be made out to the patient in his own name and should be given to him personally, no matter how young he is. The examination cards, if any are used, should be addressed to his own name and sent to him by mail. With the first examination card sent, should be enclosed a letter typewritten such as would accompany the cards given to grown people and in which the patient should be personally addressed. Such treatment serves to fasten the faith of the patient in the dentist and both young and old are likely to answer the cards on the dates indicated. •

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### ODDITIES.

By H. L. Ambler, D. D. S., M. D., Cleveland, Ohio.

At the British Museum, in the department of "Greek and Roman Life," we saw a bronze bistoury, surgical knife and spatula. A piece of tin from the foundation deposit from the northwest corner of the great building, Tell Cemaïyemi, Egypt. In the Morel collection, taken from prehistoric burials at Is-sur-til, France, are two molars and five bicuspids. From the Solomon islands is a necklace of human teeth and small shells. From the Mabode tribe, Congo, there are four necklaces of human teeth. From Aleames, Ecuador, part of a skull illustrating the method of ornamenting the upper teeth with gold, showing gold inlays in the labial surfaces of the centrals, laterals and cuspids and buccal surfaces of the first bicuspids. It seems as if small, round, shallow cavities had been cut in sound teeth, then gold disks or inlays had been cemented in place; two of the inlays have fallen out — one from a central and one from a lateral — and they are not in evidence: one lateral incisor is also missing. We did not see any date on this specimen.

The Museum of the Odontological Society at 20 Hanover Square, London, contains *many* rare specimens in a dental way. Among them are ancient necklaces of human teeth, and a full lower denture of human teeth all fastened together with several strands of gold wire placed horizontally. These wires were secured in place by passing through each interdental space vertical wires, which passed around the horizontal wires on the lingual side and were brought through and around the horizontal wire on the labial and buccal side and then twisted.



1—DR. GEORGE WATT, 1866

2—JONATHAN TAFT, 1867

3—W. P. HARTON, 1868

4—F. H. REHWINKLE, 1869

13—D. R. JENNINGS, 1878

5—C. W. KEELEY, 1870

6—B. F. SPELLMAN, 1871

7—L. BUFFET, 1872

8—H. A. SMITH, 1873

14—F. A. HUNTER, 1879

9—C. R. BUTLER, 1874

10—C. R. TAFT, 1875

11—I. WILLIAMS, 1876

12—J. C. WHINNERY, 1877

Part of an exhibit by Dr. Chas. W. Mills, Chillicothe, Ohio, at Ohio State Dental Society,  
December, 1911—To be continued.





The London Daily Graphic, April 15, 1908, has viz: Old Artificial Teeth Bought. Dr. Paget pays the highest price. Call or post. Immediate cash. 219 Oxford street, W. London. Firm established 150 years.

Old Artificial Teeth Bought. Persons wishing to receive full value should apply to the manufacturing dentists, Messrs. Browning. If forwarded by post, value per return. 630 Oxford street, London. Established 100 years.

**FREE TEETH.**—The Free Teeth Association has been formed to supply Artificial Teeth Free to the deserving poor and to supply those of limited means, and servants, by small weekly or monthly payments. For every twenty sets supplied on the instalment plan we give One Set Free to the most deserving case. We give them entirely free — there are no conditions whatever. For forms of application apply by letter to Free Teeth Association, 177 Westminster Bridge Road, London.

In the window of what might be called a pawnshop we saw a dish containing several full and partial sets of teeth, mostly on vulcanite, black, red or maroon. One partial set was on gold and one on silver. They had been purchased from different people, who parted with them for numerous reasons, and the shopkeeper exposed them in his window for sale at very moderate prices.

In different drug stores abroad we saw for sale Lyons' and Colgate's tooth powder, Sozodont, Dioxogen, Glycothymoline, Euthymol and Sanitol. Alkalol is on sale in six cities in India.

The following is from a London magazine: Dr. Howard H. Tooth, C. M. G. (companion of the order of St. Michael and St. George).

## THE DENTIST AND THE COMMANDMENTS\*

By F. A. Wildason, D.D.S., Eaton, Indiana.

**A**T A CERTAIN college in the East the Sunday services are often conducted by prominent clergymen of the various denominations. When these visiting ministers ask of the president of the college how long they shall preach, he invariably replies: "There is no limit, sir, to the time you *may* preach, but there is a tradition here that no souls are saved after the first twenty minutes." So, with the pleasing promise that I will not weary you for a greater period than necessary, I shall address myself to the subject.

We hear much these later days of the various dental operations, such as fillings, crownings, inlays, prophylaxis; and we have sat in this hall during this meeting and listened to masterful and interesting discussions of such operations. But this paper will digress just a little from the conventional and usual topics of discussion and will speak of the filler of teeth rather than the filling—the dentist himself rather than the profession.

\*Read before the Louisiana State Dental Society, 1911.

Thirty-four hundred years ago the tablets on which were inscribed the ten commandments, which were supposed to fashion the lives of individuals, were given to men by their Creator from the top of Sinai mountain. Although since that time men have often neglected and at times completely lost sight of these commandments, yet today they have a specific application to every individual. They apply to the lawyer as he labors for his client. They apply to the statesman as he frames the organic laws. They apply to the dentist in his relation to the public and the profession.

The first mandate thundered forth to the Israelitic people was: Thou shalt have no other God before me. Now the question arises, to what extent does the dentist follow this teaching? Does he not put up idols of the heart? Does he not erect idols of fashion? Does he not establish idols of vanity and ambition, and are not these idols forbidden by that commandment as well as those fashioned from wood and stone? The dentist of today is not only constructing idols of fashion, vanity, and ambition, but he is contemplating the erection of a greater one than any heretofore, which he intends to call the Golden Eagle, and which will be as vicious, as destructive, and as degenerating as the golden calf in the wilderness. So radical are we becoming in the mad desire for money that we blind our vision, dwarf our conscience, and repress our religion in order that we may jingle a few more shekels in our pockets. We desert the common sense doctrines of dentistry and bow to the ignorant demands of vain, untutored patients, placing gold crowns upon anterior teeth, thus throwing esthetics to the wind, simply because the patient is vain enough to ask it and we are greedy enough to grant it. A Richmond crown would not only require very little more time and skill, but would also be more in harmony with Nature and our code of ethics. Although the money proposition may be alluring, and the economy of time enticing, we should not pander to the whims of a few unsophisticated individuals who have been beguiled into vanity and ignorance by the advertiser. Let us not yield ethics to ignorance nor desert the Golden Rule for the Golden Eagle.

The second commandment not only forbids the erection of graven images, but also provides a penalty for such offense, for it says that such a violation of the law shall be visited not only on us, but even on our posterity to the third and fourth generation. And although there is a limit to the direct visitation of the curse, still, by the laws of heredity and blood, Nature so moulds that it becomes a permanent thing with a permanent evil effect down to the remotest generations. The love of home and liberty which characterizes the twentieth century American, which made it possible to dampen the snows of Valley Forge with the blood of the ragged Continentals, which made it possible to storm old San Juan Hill, and which makes it possible to have one country, one God and one flag, can distinctly be traced back to our old Teuton ancestors who struggled with Caesar in the province of Gaul. The love for personal freedom, which has made old Ireland the cradle of liberty and the nursery of heroes, which

gave to modern history the immortal Emmett and in whose behalf William E. Gladstone became the "grand old man of England," can be traced back to the hovel and the mart of the lone Irish fisherman beside Killarney Lake. And in the same manner that such virtues are cultivated, just so are evils inculcated permanently into races and families. It was the greed for power, coupled with sexual depravity and illegitimate wealth, that transformed the kingly Roman into the modern organ-grinder and his inseparable monkey. So any evil which is fastened on us for any length of time whatever will tend to become a permanent fixture; and these idols of fashion, vanity and ambition will not only bring destruction to us, but will continue the shame and the disgrace to ages yet unborn. We owe much to ourselves; we owe more to our families. And if it is destructive to us to follow such guiding stars, it is even more destructive to the little red-headed boy and the little freckle-faced girl who look up into our face for the realization of their grandest dreams. If we refuse to resort to this process of "quackery," which tears down rather than builds up; which destroys instead of constructing, we shall hand down to those of our own flesh and blood a name of infinite honor, and they in future years will rise up and call us blessed.

Now comes the third commandment, declaring against profanity and all things that vainly misrepresent the Creator. As a possession or a habit, profanity is not beautiful, it is not honorable, it is not gentlemanly, and we bring no credit upon ourselves and polish no existing lustre when we make our mouth a practical sewer for the filthiest and vilest and meanest epithets which the English language affords. How can we hope to sustain the dignity of our profession and preserve the integrity of our manhood by directly violating that commandment which makes all heaven weep? It may produce a grin; it may create a smile; but it lowers our reputation in the mind of every sound-thinking patient, and even today it is true that "one may smile and smile and be a villain." Quit harping on prophylactic treatment until you have prepared the way by a moral disinfectant. What the mouth of many a dentist needs before he deserves to criticise the mouth of his patient is a good job of house-cleaning, with plenty of scrub brooms and an abundance of soft soap. So, instead of publicly announcing the fact that we are not gentlemen by means of the oath which we employ, let us cleanse and mollify our speech and elevate our character beyond the slightest suspicion.

As to the fourth commandment, which decrees a proper Sabbath observance, the dentist is brought under the mandate as well as every other man. He should affiliate himself with some church, attend as regularly as possible, and inspire by his word and example a brotherly spirit among those with whom he comes in contact. This does not mean that he must harangue the patient, who is already worried by a throbbing tooth, about the church dues he should pay and the time and labor devotion he should make to the church. There are more ways of creating and sustaining a fraternal movement than by discussing eternally the spiritual needs and



the spiritual debts. If the dentist, in the usual routine of his practice, can drop one single word or do one single act that shows his connection and relation to religious institutions, he will not only benefit the patient but will elevate the profession by proving that however practical and technical it may be, this same practice and technicality do not drive it from the worship of the Creator. So the dentist should observe Sunday as a day set apart for the specific performance of religious worship, and not only should he do this for the moral uplift, but he should do it for the physical advantages also. Six days of close application to indoor dental work, during which time he sees and talks to and works with people physically distressed, serves both to discharge his full duty to his family and to wear out and exhaust him too often entirely. On the seventh day it is far wiser and exceedingly better to turn himself out to pasture, to take a vacation, and during these short hours to lead his mind away from the cares and duties of his office, into the truer and higher and sublimer things of life. Thus he will not only rest himself, and be better equipped to handle the distress of his patients, but he will rejuvenate himself by drinking in the beauties and the joys of truth and virtue.

The fifth commandment instructs us to honor our father and our mother, and is the only one that adds a promise, "that our days may be long upon this earth." How does this apply to the dentist? Very often it does not apply, or at least its application is invisible. How prone are we to neglect the father whose wisdom guided us through the struggles of childhood, and to forget the mother whose tired fingers, laboring through the weary hours of the far-spent night, made it possible for us to secure credit and honor in the world. In these days of commercialism, when the professions have become money-mad, when the mad cross-currents of envy, jealousy and hatred tend to destroy the virtues of men; when every man is chasing his own rainbow and abusing his neighbor with all the anathemas of scorn that his fertile resources afford; when the latter-day Pharisee stands before his Sunday school class on a Sunday morning and tells them of the blessing of parental love and on the next morning raises the price of oil one cent on the gallon and makes ten million dollars—I say in this latter day we have journeyed far astray from the duties we owe our parents, and the fifth commandment has become nothing more than "sounding brass and tinkling cymbal." We will admit that the dentist is a busy man, but he is not too busy to give due honor to those who gave him life. The hearthstone of the vine-clad cottage is the cornerstone of our profession. And we have yet to find a single failure in dentistry of anyone who followed the teachings of a good mother. Said old John Bright, on the death of his statesman friend: "I never knew how much I loved him till I lost him." And we never fully appreciate any more than we fully honor the virtues of a mother until we no longer can know her. And if we do put forth an effort to discharge our duties to our parents, we will be more highly respected, more respectful of ourselves and more reverent for the rights of others.

The sixth commandment is one of the highest importance, for it declares that "thou shalt not kill," and if there is any desire implanted in the human breast more firmly than any other it is the desire to live. So strong is this inclination that it makes heroes and heroines out of men and women. President Garfield, when told by his physicians that he had but one chance in a thousand to live, replied, "We will take that chance." And since human life has been so wished for, in spite of all the troubles and distresses that accompany it, it has become an inviolate right and heaven has placed upon it the brand of sanctity. All human life is sacred, for there is a chord that reaches from every bosom to every other bosom, and the sweetest music and the most symphonic melodies are attained when these chords are played upon by the angels of our better natures.

To the dental profession this commandment applies with redoubled force. Too often we kill when we should create; too often we blast when we should give succor; too often we destroy when we should uphold. We withhold the gentle word, the friendly handclasp, and the tear of sympathy when they might be of value, and not until our rival has been defeated in his life work do we venture one word of commendation. We let him sink beneath the waves of failure and when we see his last faint gasp for breath we reluctantly extend our hands and reach forth our arms in a vain effort to recover that which has been forever lost.

To illustrate my point precisely, I will take the young dentist as he comes to our town after his memorable graduation night at college, overflowing with ambition and steeled to the proposition that he will hew for himself a path to an honorable and illustrious position. He makes mistakes to start with, natural and minute, and ones that could well go unnoticed. But we, fearing that he may develop a stronger ability than we possess, and dreading to part with those patients of ours whom he may win by his honest efforts, magnify his mistakes into mountains of error; drop the slighting remark that insinuates at his ignorance; shake our shoulders with the accustomed shrug, which speaks so little and says so much; and with a haughty air, a mobile disdain, a cynical sneer and a smile of savage satisfaction, we heroically fold our arms and walk away. What a piece of work is the dentist! How infinite in wisdom; how gracious in friendship; in professional work how gentle; in love for his next-door dentist how like a god! We have done the deed. We have cast the die. The listening patient has drawn the inference. The work is completed. No human eye discerns it; no human ear perceives it; the secret is our own and it is safe. Ah, no! There is no nook or corner in all creation where the guilty can bestow such a secret and say that it is safe. Its results soon reach their culmination, and our neighboring dentist, whom we should have helped and encouraged, with his practice depleted, his ambition shattered, and his pocket empty, sinks from the true professional level of ethical dentistry into the quagmire of the advertisers, setting forth in gaudy signs: "Crowns, \$4.00; plates while you wait, \$5.00; fillings for

50c: the cheapest bargains in dentistry." I shall pursue this subject no farther, but is one that should stir the mind of every dentist who believes in the profession and takes pride in his work. We are not here to destroy youthful hopes. We are not here to crush young ambitions. We are not here to create advertisers. We are not here to bring disgrace upon the profession. We are not here to destroy homes and break hearts. We are here to dedicate ourselves to the unfinished task which Miller, Wells, Brophy, Black and Hunt have so nobly advanced. And with malice toward none and charity for all, let us continue in their course.

"Come, let us be kind to each other,  
 As through this rough valley we roam;  
 For we may not be far from another  
 That leads to a heavenly home.  
 Let us journey together in gladness,  
 And should we be troubled with care  
 Let us never give way unto sadness,  
 Nor sink in the gulf of despair;  
 But if we are kind to each other,  
 As through this dark valley we roam,  
 We may pass through the shades of another,  
 To enter a happier home.

"Yes, let us be kind to each other,  
 And kindle a ray of delight  
 In the eye of a friend or a brother  
 That beameth in sorrowful plight.  
 Thus, thus if we travel delighted  
 A brother's distress to remove,  
 Our hearts will e'er be united  
 In harmony, wisdom and love.  
 And thus being kind to each other,  
 As through this rough valley we roam,  
 We may pass through the shades of another  
 To rest in a happier home."

In the days of old corruption was an overpowering force, and a specific form of corruption known as the defilement of the body was so common that the seventh commandment was made in order to preserve chastity. We should be as much afraid of those things that defile the body as of those things that destroy it. Man was created a hog, with the disposition to lie down in the trough and monopolize the swill; and even though he may not be able to consume it himself, he will have the pleasure of cheating his brother out of it. The lamentable thing in connection with this is that though he might have outgrown this spirit and put away childish things, yet it remains a woeful fact that he has rather increased than diminished it. There are some things for us to forget as well as things to remember. It is our duty to serenely pass over the vile and loathsome things, to put from our minds all impure thoughts; to weed from our hearts all unchaste motives, for purity is the safeguard of the home and



the stronghold of the nation. Plato would exclude from his republic all things that would debase the taste, the touch, or the sight of its citizens, not even admitting poor pictures or imperfect images.

We place too much trust in innocence and we cherish beyond expression the gentle blush and the maiden smile, believing that these form a fortress that cannot be stormed by all the powers of pillage, or captured by the hosts of wrong. But in our blind fanaticism, we do not discern the weakness and frailty of this defense. Parents are utterly astonished when they see their boy or girl of eighteen going astray, and all the logic in the world cannot convince them of the truth that their boy or girl really was lost when only eight or nine years old. We excuse our initial depredations upon the ground that we didn't know any better, and so long as this continued that the boasted element of innocence has become almost a cloak behind which every licentious man, woman and child seeks concealment. "The greatest need of France," said Napoleon, "is better mothers," and France today is tottering for the want of them. Rome was clouded into obscurity and shattered into oblivion because her citizenship could not stand corruption. The United States has fostered this to an extent almost incomprehensible, and in grand old mother England, during 1910, the death rate exceeded the birth rate. But I am glad to say that the forces for good are disputing the further advance of this corruption, and the noble leaders of the various countries, banding themselves together in auxiliary, temperance and chastity unions, are doing a noble work. For these women I have the profoundest reverence, and I would say:

"O, spotless women in this world of shame,  
With silent and steadfast scorn,  
Go back to God as white as you came,  
The kingliest warrior born."

It would be well for the dental profession to make a united effort in this direction; to lend their encouragement to all noble movements; to smile upon chastity and to frown upon impurity. Let it enthrone virtue in its homes; discard false modesty; deal with the plain truth in a plain manner; yield up the cloak of mocking innocence, and follow only those beacons that guide it to an elevated, and ennobled, and purified position.

The eighth commandment is the one we learned at our mother's knee and from our mother's voice, whose gentle, silvery accent admonished us over and over again to be a good boy or a good girl. How many times have we heard that kind advice to take nothing which is not ours? How often have we failed to follow that wisdom and have instead plucked at our neighbors' treasures? And so uncommon is it to find an individual of sterling honesty that a great poet exclaimed: "An honest man is the noblest work of God." We cannot but have admiration for the little black, ignorant slave boy, standing on the auction block in a far-famed southern city, who when the contemplative buyer questioned him thus: "If I buy you, will you be honest?" replied, "I'll be honest whether you buy me or not." Honesty is that determining principle which sets the character into

hard and stable form. Governor Hughes, while investigating the corruption in the state of New York a few years ago, made this statement: "That the test of character may be found in the faithful discharge of duty when it might be abused with seeming impunity." We are honest in public life, where the threads are scanned and the tablets read; but back in our little secret closets we conjure up mammoth theories and then put them into execution. Like skulking cowards, we foster our devices 'neath the shield of darkness or the cloak of concealment, believing that we, dressed in our little brief authority, so that our time and place cannot know us any more, cannot only deceive the world but even the wisdom of the Infinite. Thus early in youth we pitch our tents toward Sodom and accept within our mould the seed of destruction, and it is a written fact that everything conceived in fraud must perish in a lamentable end. We ethical dentists, who believe in the cardinal virtues, exalt honesty to a place in the sky at the earliest opportunity, let us take an invoice of our thoughts and actions and see if we are paying homage to the right deity. See that we do not charge our patients more than the actual cost of the material, plus the cost of production and a reasonable profit. See that we are not stealing from our neighboring dentist a patient whom he deserves to have and who could be forced to the change only by underhand methods. Let us look into our own faces, shake ourselves by the shoulders, review the record that contains our history and see if we are really following the eighth commandment.

The ninth commandment concerns our own and our neighbor's good name, and in all countries the laws have fixed penalties for false testimony. The Egyptians visited perjury with death. The Greeks imposed a heavy fine with loss of civil rights. The Jews condemned the false witness to suffer the punishment which his evidence was calculated to inflict.

Ethics teaches us that we have no right to repeat that statement which injures our neighbor, even though it be the truth. And how much less have we dentists the right to welcome, to listen to, or to repeat such statements injurious to our neighbor dentist when they are not true. If it is wrong to tell, with blunt tongue, the truth that injures, it is doubly wrong to tell, with malicious tongue, the lie which destroys. "Who steals my purse steals trash, but he who steals from me my good name robs me of that which not enriches him but leaves me poor indeed." Reputation, says Shakespeare, is the immortal part of one's self and all else is bestial.

How much could we do if men were true. If brothers should lay down their arms and struggle with the same burdens; if civil strife could be subdued; if the modern Sohrab and his father Rustum could be forever reconciled and harmony might prevail not only in every profession, but in all of them combined. The mightiest struggle that ever rocked this continent owed its force and power to the fact that brother was fighting brother and father was fighting son. And as General Lee was standing on the top of St. Marye's Heights and viewing the maimed and slaughtered who fell in

windrows from the three fierce charges that beat fiercely against the stone wall, exclaimed in the agony of his manhood: "It is well that war is so terrible or we should grow too fond of it." What, I say, could we do if men were only true and faithful to the right!

"If you are tempted to reveal  
A tale some one to you has told  
About another, make it pass  
Before you speak three gates of gold,  
Three narrow gates—first, "Is it true?"  
Then "Is it needful?" In your mind  
Give truthful answer, and the next  
Is last and narrowest, "Is it kind?"  
And if to reach your lips at last  
It passes through these gateways three,  
Then you may tell the tale, nor fear  
What the result of speech may be."

"The bugle sounds and the wild echoes fly forth, but soon faint on the hill and dale and river. Our echoes roll from soul to soul and grow forever and forever."

Vainly do we appear in the darkness in search of a saving light. We cry for succor, and the only answer is the echo of our wailing voice. We lift our wearied arms and stretch our tired gaze scouring the entire universe for a light that will not fail.

"We dip into the future, far as human eye can see,  
Behold a vision of the world and all the glory that would be,  
When war-drums throbbed no longer and the battle flag is furl'd  
In the Parliament of Man—the Federation of the world."

And with this beautiful promise, let us keep our faces turned toward the morning. What does it mean to have our faces turned toward the morning? It means to believe in the things that are and the things that will be. It means to believe that today is better than yesterday, and tomorrow will be better than today. It means to believe in the ultimate triumph of right and the ultimate downfall of evil. It means to believe in that "one far-off divine event toward which the whole creation moves." With this doctrine as our creed and this motto as our slogan, we can purify the dental profession and make the entire world better by having lived in it.

The tenth commandment is unique in every phase. Its predecessors deal with the external man—his features, his actions, his appearance. This commandment deals with the internal man—with the thoughts and the feelings and the motives which are the source and origin of all visible things. How true it is that the real things are the invisible things. We notice the pugilist as he comes forth in all the glory of his manly strength, with his hardy limbs and his developed muscles. But this appearance is only the fancy of the reality which consisted of his regular daily practice. We cannot judge men entirely by their acts. We should judge them by



their motives, for a man is always greater than his greatest act and always meaner than his meanest one. Neither is there any art to read the mind's construction in the face. It is true that one gradually comes to look like that which he thinks and does. It is true that the miser's voice jingles, the scoundrel's nose reddens, the convict's eye pales and droops. But the "fawning publican" is able to transform himself in some such Jekyll and Hyde fashion that he can seem the innocent flower and be the serpent under it. It is this faculty that has made so much crime possible. The devil with horns and hoofs never won any following, but the crafty Iago and the polished, cultured, refined Mephisto have trumped their worshipers by the thousands. Thus it was deemed necessary to legislate not only against outward villainy, but also to demand inward purity.

Covetousness is neither envy nor jealousy, yet it is the mother of both. The dentist does not covet when he desires a larger practice and a greater income. Neither does he exactly covet when he envies the success of his professional friend. He does covet when he possesses the dishonorable desire of winning in illegitimate ways the patronage of his neighboring dentist. We as dentists want dentists to make money, we want them to make lots of money, but we want the dollars we make to be so honest that our babies can play with them and not get blood-poison. The field of dentistry is as large as the world. We are no longer tooth-carpenters and tooth-tinkers, begging alms and soliciting recognition. We have risen to an enviable position and to that plane which is as honorable as the plane of any profession under "Old Glory's" stainless stars. We have access to all people and consequently the resources of our patronage is limited only by the limit of population. So we do not necessarily have to deprive our neighboring dentist of that which is rightly his in order to meet our own expenses; and such thievery is recognized only in love and war. If we are going to be warriors, let us carry a sword. If we are going to be lovers, let us take pride in our calling and see that it is well done. But if we are going to be dentists and want to be called a member of the profession, we dare not resort to foul means without giving up the badge of fellowship. Remember that we are but

"Ships that pass in the night and speak each other in passing,  
Only a signal shown and a distant voice in the darkness,  
Thus on the ocean of life we speak and pass one another,  
Only a look and a voice—then darkness again and a silence."

If after we have polished off our rough edges, have covered our shining faults, have refined our raw material—after we have done all this and have made an honest effort to help our brother dentist and still fail to be successful in our profession, we may then feel sure that we have discharged our duties with all the grace that we could and that the fault, if there be a fault, "is not in our stars, but in ourselves that we are underlings."

And now I have almost finished. From the beginning to the end this discussion perhaps may have seemed peculiar to you, and I will not attempt to deny that its peculiarity has possibly arisen from the peculiar individual

who happened to be its author. But I trust that it will be better understood than its author has ever been, for my dear old mother who rocked the cradle in which I slept, who wept the bitter tears of sorrow at our parting—my mother who went down into the valley of the shadow of death to give me life, even she does not understand me. And perhaps it was this idiosyncrasy that led me to choose such an uncommon subject as "The Dentist and the Commandments." I profess in my career hitherto, to have kept steadily in mind the practical part of dentistry, but I have endeavored at the same time to especially search out the philosophy of the subject. It is well that we do not wander from the morals and ethics of our profession, and it is often profitable to pause long enough to ascertain the answer to the question, "Watchman, what of the night?" And in such moments of tranquil and silent thought, if we could only return to that period of childhood before the battles of professional service had hardened us, or the tragedies of human life had stamped upon us indelibly the vice that they bring, we would find, undoubtedly, the fountain of perpetual purity.

"Backward, turn backward, oh time in thy flight,  
Make me a child again just for tonight."

We are tired of the hollow, the base, the untrue. We are so weary of dust and decay. Weary of throwing our soul's wealth away; and we long for the choir invisible whose music is the gladness of the world. Therefore, I have tried to call you from the accustomed haunts of the real into the serene heights of the ideal, where the vision is longer and the landscape far grander. I have not hatched up new and idle theories. I have only set forth plain truths, unadorned and unornamented by chosen language. And the theme of it all is that the dentist shall not crucify his profession nor place a fruitless crown upon his manhood. I can conceive of a dental profession in which every ethical and every moral code is observed to the letter. I can conceive of a dental profession in which every hand is raised to help its brother and none lifted to smite or destroy. I can conceive of a dental profession in which every heart-beat testifies to the brotherhood of man, and every pulse-throb to the union of humanity. I can conceive of a dental profession in which every one is a hero and a sovereign, but in which no one cares to flaunt his laurels or to wear a crown. I can conceive of a dental profession in which every member is living for the right that "lacks assistance, for the wrong that needs resistance, for the future in the distance, and the good that he can do."

"There are hermit souls that live withdrawn  
In the place of their self-content;  
There are souls like stars that dwell apart,  
In a fellowless firmament;  
There are pioneer souls that blaze the way  
Where highways never ran,  
But let me live by the side of the road  
And be a friend to man.

"Just let me live by the side of the road,  
 Where the race of men goes by,  
 They are good, they are bad, they are weak, they are strong,  
 Wise, foolish, and so am I.  
 Then why should I sit in the scorner's seat,  
 Or hurl the cynic's ban?  
 Just let me live by the side of the road,  
 And be a friend to man."

There are two ways to honor a profession. One is to build it on a solid rock; the other is to keep it pure. Miller, Wells, Black, and our illustrious Dr. P. G. C. Hunt have discharged their duties. It was theirs to erect the profession on a safe and sure foundation; let it be ours to keep it building ever straight. It was theirs to tear it from alien and unfriendly hands; let it be ours to defend it against all of its enemies. It was theirs to lift it into the sunlight; let it be ours to keep it ever pure. Knowing that humanity and the dental profession as well are only as good as the individuals that compose them, in the light of this last sentiment let us ever live. In this pathway let us ever walk; in order that we may bring forth fruit unto the harvest; in order that we may ennoble our profession; in order that we may enrich our manhood; in order that we may shed blessings all about us; and in order that we may hasten, in our humble way, the approach of that time foretold by the singer, "when swords shall be beaten into plowshares and spears into pruning hooks," that time foretold by the poet,

"When man to man the world o'er,  
 Shall brothers be for all that"

the wonderful "Golden Age," the "New Era," the "Perfect Day."

#### DISCUSSION.

(Read by Dr. Ross.)

Dr. S. B. HARTMAN, Ft. Wayne, Indiana: I hardly know what to say on that subject; it is like two and two make four. You can not discuss it very much, it is self evident. But I must say that, while this is something out of the line of what we generally have, it does appeal to me. There is a great deal in it that we ought to take home with us and thoroughly consider.

There isn't a person within the sound of my voice but what, if he would take the ten commandments as given to us and practice them, would be a better man, a better dentist, and a better citizen. I hope the other gentlemen who are on for a discussion of this paper and who have probably made some preparation along the line, will soon be here and we shall hear from them. I feel that there is so much in this paper that I want to say something in praise of what Dr. Ross has said.

#### REVIEW BY DR. ROSS.

I am glad that you set them right about my being the author of this paper. I am not. My friend, Dr. Wildason, of Eaton, is the author, and it was handed to me about an hour before lunch, with the understanding that Dr. Wildason's baby had become very sick and he had to stay at home and that I should read it.

Personally, I do not subscribe to the theory that Dr. Wildason's paper tries to create. I rather labor under the impression that Dr. Wildason's liver was out of order when he wrote that paper. It seems to cast a reflection upon the dental profession, that generally speaking we are not gentlemen; that we have to set up a hard set of rules under which we have to treat our patients.



I think Dr. Wildason has taken the subject a little too seriously. There is not a profession practiced by educated men today in which the men work harder and get less for their services than they do in dentistry. Dentists do not get anywhere near the fees, anywhere near the financial returns for the length of time in which they engage in operations that are received in law, medicine or any other profession. The poor fellows are hustling all the time to make both ends meet.

So I think that Dr. Wildason's paper has overshot the mark when it tries to create the impression that dentists are putting over-emphasis on the financial end of the question and not giving the people proper return for their money. So, far from being responsible for being the author of the paper, I do not concur in the sentiment expressed by the paper, and I believe as a rule the dental profession is made up of as true gentlemen as any other profession and that they give better service for the dollar than do the members of any other profession practiced today.

## THE PROFESSION AND ITS RELATION TO THE PEOPLE\*

By H. E. Strain, D.D.S., Bloomington, Ind.

SOME NINETEEN hundred years ago, when teaching the parable of the Good Shepherd, Jesus said: "I came into the world that they might have life and have it more abundantly." It matters not, for my purpose, whether you look upon Jesus as a God, a man, or both God and man. We believe that what Jesus said of himself while here among men holds true of the world today. According to our view of life, it is the duty of each individual to help raise the social and moral standard of his community—yes, of the world; that the people may have a more abundant life; that they may have more real pleasure and enjoyment; that they may see and realize that there is something more in life than mere drudgery. Every man is entitled to enough of this world's goods to enable him to live comfortably, educate his children and lay by something for the rainy day. If he is not getting this out of life, it is either his fault or the fault of the public. Every child born into the world should grow up and be strong and healthy, both morally and physically. He is entitled to go through this life with but little pain and agony from a diseased body; but how few are the number that even approach physical perfection and alas, how few are the number born into the world who live out the allotted three score years and ten without suffering many times from diseases that might have been prevented. Many children come into the world and are doomed to a life of disease and suffering because of the vile and immoral conduct of their parents; and many children of good moral parents will go through life suffering from diseased bodies, because of the ignorance of the parents, and others will suffer during their lives because the medical and dental professions fail to do their duty. No man, be he a professional, business or laboring man, is fulfilling his mission in the world if he is not working, in some measure at least, for the betterment of humanity. There is no profession under the sun that has the opportunity to mould and shape the lives of the present and future generations as has

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\*Read before the Indiana State Dental Society, 1911.

the dental profession. You may think this a pretty broad statement. You say, how about the ministry and the medical professions? We are not spiritual advisers professionally, but it is the belief of ministers today that it takes a great, strong, healthy man to make a good follower of the Nazarene. The ministers are correct in their opinions, too, for it takes a strong, healthy man to do very much at any honorable work. So you see we must so instruct our boys and girls and put their mouths in such shape that they may grow up well developed and healthy. Then the ministers will have good material upon which to work, and when they do get an army of such boys and girls and men and women to work they will accomplish something. As to the physicians, when we come into our own, when we eat, breathe and live as we know how to do these things or as we will know, and when we teach the people to eat, breathe and live as we are going to teach them, the physicians can then follow the old adage and, literally, "throw physic to the dogs." The surgeon, too, will lose many of his large fees, for when the people learn to take the proper amount of the right kind of food and chew it as it should be chewed, there will be no more gall stones or appendices to remove. He may be called occasionally to give surgical attention to a patient who has been struck by an automobile, run over by a street car or fallen from a flying machine. This picture of the physician may be somewhat overdrawn, but when we consider the percentage of diseases that are caused by too much food improperly masticated, or rather not masticated at all, or by disease germs that find lodgment in unsanitary mouths, where they multiply and are carried into the respiratory and intestinal tracts, setting up a condition that leads to disease and in many instances to death, we can readily see how a doctor's bill might be saved by correct living.

Dr. George E. Hunt, some two years since, in discussing Dr. Sexton's "Sermon on Saliva," said: "I am convinced that fully half of the ills that flesh is heir to are due to improper mastication of the nitrogenous foods, the meats especially." If to the half of the ills due to improper mastication are added those caused by unsanitary mouths, and over-eating, we find that a very large percentage of the diseases gain entrance to the system through the mouth, that part of the anatomy with which we especially have to deal. This being true, it seems to me that if we grasp the situation as we should, if we do our duty as we should do it, we will do more to prevent diseases than any other profession.

Have we grasped the situation? In the past, and to a great extent the same is true today, we have been devoting our time and our energies to the devising of the best methods of repairing the damage done to the dental organs, damage caused by negligence, damage that is preventable. We have been locking the door after the horse was stolen. We are just now beginning to realize that we must lock the door before the thief gets into the neighborhood. We must devote more time to prevention than to repair. If we could induce the people to chew their food properly, keep their mouths in a sanitary condition and breathe plenty of pure air, a

great many of the diseases we now know we would know no more. There would not be such a demand for drugs, neither would we be called upon to erect so many monuments to departed teeth. If we can teach the people to eat and breathe properly and keep their teeth and mouths clean, it will limit the physicians' practice to prevention. It is a wonderful thing for a physician to restore to health a typhoid patient, but it is more wonderful and much less expensive for him to see that the people live according to sanitary and hygienic laws, that they may not be afflicted by the fever. It is a wonderful thing for a dentist to remove a number of broken-down, diseased teeth and insert in their stead an artificial denture that is almost an exact counterpart of Nature, but how much more wonderful and how much more satisfactory to both the patient and the dentist for the latter to begin with the patient when a child, looking after his mouth, teeth, and health through childhood and youth and on through later years, thereby being able to preserve the natural teeth, and by so doing preserve the health and vigor of the individual.

We can prevent disease and decay of the dental organs, but we can not cure them. We can and do make a feeble effort at repair. We have been doing untold good by relieving pain and suffering, and no doubt in many instances preventing death. We have all seen many persons regain their health after their mouths had been put in good condition by repairing the natural teeth or inserting artificial dentures. Is this as far as we should go? If it is, we will never benefit humanity as we should.

Dr. Alfred C. Fones says in the (January, 1911) *Items of Interest*, "Like an immense flood, dental caries have come in with civilization, and that flood has now become so great that the thirty-five thousand dentists of this country, practicing chiefly along the lines of repairing damages, might as well try to sweep back the ocean with a broom as to confine their efforts to operative work alone. Less than ten million people in this country pay any attention to their teeth except to have them out when they ache." He says, "If all the thirty-five thousand dentists of the United States should concentrate their entire efforts on the people of Greater New York it would take them a full two years to restore the mouths to a sound and healthy condition."

Dr. Truman W. Brophy said, in discussing a paper at the National Dental Association, "There are not dentists enough in the states of Illinois, Wisconsin, Iowa and Missouri to care for the children of Chicago." If what these men say is true, we have something before us other than filling, extracting and making plates. The job we have on our hands, and it rightly belongs to us, is to teach the people to take care of their teeth. Some one has said, "The most serious business in life is living, and the next most serious business in life is teaching others to live."

Dr. W. G. Ebersole of Cleveland, in his report on oral hygiene at the meeting of the National Dental Association, said: "The most important obligation of the dental profession of today is to teach the people of America, aye the world, the proper use and care of their mouths and



teeth. Their second and most difficult obligation is to teach the rank and file of its members to instruct the people." Here and there we find a few men who are beginning to realize that the best service we can render is not that which builds up and restores a broken-down incisor or inserts an artificial denture, but that which retains the natural teeth in a sound, healthy condition, is the best and most satisfactory service we can render. The question is, how are we going to render this service? How are we going to reach the people? There are many good things being done in many different parts of the country.

The appointment of two dentists as lecturers by the State Department of Health in New York, the appointment of dental internes for some hospitals, the school clinic in Rochester, the free clinic in other cities, dental examiners for schools in many cities, the Illinois Public Press campaign, and the Forsythe bequest are some of the recent advancements that have been made, which no doubt is only the beginning of the great movement which will ultimately awaken both the profession and the people to the fact that they cannot have strong, healthy bodies and minds unless they keep their mouths in a healthy condition.

The *Digest* of November, 1910, prints a statement from W. A. Evans, M. D., of Chicago, in which he says, referring to dentists, "You will not have your proper standing in the community until no teeth are neglected." If this is true, I am convinced that no one present today will ever have his proper standing. However, I am sure that none of us will stand very high in our own estimations if we turn deaf ears to the hundreds of children in our own communities, who will never be healthy either physically, morally or mentally unless we as a profession awaken to the fact that we owe something to humanity, something more than we can pay by operating in the mouths of the few who find their way to our offices. How are we to accomplish this?

On the first page of the first issue of *Oral Hygiene* the editor writes an article bearing on this question under the heading, "What is the best way?" In the third number of the same publication, J. P. Corley, M.D., D.D.S., Sewanee, Tenn., says, "There is no best way." He says there are many ways and "No one way can be adopted to the exclusion of others." Dr. Corley is right, for we should use every legitimate means we can to get the people to realize the value of good teeth, yet I want to say to this association that there is a best way, and before any dentist can be successful, so far as elevating the profession or educating the public is concerned, he must adopt this best way—the way of a true man. Every legitimate calling or profession needs such men, and if better men are needed in some callings than in others, I believe the medical and dental professions need the very best. These professions should have men who are physically strong and clean, men whose morals are unquestionable, and men who are honest in every sense of the word. No one but an honest man should be permitted to perform operations in the mouth of a patient, because if dishonest he might do the work in such a way, for a fee, that

would mar the entire future life of the patient. I believe the great majority of men in the dental profession are honest and upright in a professional as well as in a business way, but they are not all of this class, a fact of which we are convinced when we glance over the advertising pages of the city papers. All advertisers are not dishonest, neither are all dishonest dentists advertisers. Every dentist is an advertiser, whether he is honest or dishonest. If he is dishonest, he may put an advertisement in the Sunday papers, heralding the—I was about to say *fact*, but I will call it by the right name and say *lie*, to the world, telling the people that he can do painless work, put in teeth without plates, etc. According to our code of ethics, neither an honest or dishonest association man can advertise in the papers. The code may be, and I think should be, so changed that a dentist may write an article over his own name for the press, dealing with some phase of dentistry, such as prophylaxis or oral hygiene, that might be of great benefit to the public. Such articles from prominent men of the profession would make an impression upon the people, and no doubt if articles of this kind appeared often enough the public would begin to think the teeth were made to use, and they might finally be induced to use them. If such a procedure causes more people to consult the dentist, all the dentists of the neighborhood in which the papers containing such articles circulate will share in the increased patronage. If we cannot advertise according to the preceding method, we can advertise by our walk in the community in which we live and practice. If we are clean in our habits, if we keep our own mouths clean and healthy, if we keep our offices sanitary, if we chew our food as we should, we can then have some influence when we advise our patients in regard to these things. How many of us come up to this standard?

I sat at a table in a restaurant in our little town a few weeks since—you might call this restaurant a cosmopolitan lunch room. It is a good place to get a lunch, and people of all nationalities represented in our little city drop in there to eat; or you might call it a free-and-easy lunch room—you do not have to bother about table etiquette. Some of the men remove their hats before they dine and others dine with their hats on because they are in too much of a hurry to get through and get about their business. On this particular day to which I refer there happened to be four dentists taking lunch in this restaurant. Did these four set an example before the people? I am glad to say they did, not in masticating their food—they seemed to be in as much of a hurry as the rest of the crowd—but they did remove their hats. One of the four was the writer and another was a member of the State Board of Dental Examiners. I do not think this an extreme case at all. I think you will find that the dentists of our town will average up with the best. If we, the members of the profession, knowing the value of good teeth, sanitary mouths and properly masticated food, neglect our own teeth and fail to chew our food, how can we expect to influence the public for good in these matters?

Swedenborg says, "It is of no advantage to man to know much unless he lives according to what he knows." The preacher who tells the people to do as I tell you, not as I do, will accomplish very little in the way of building up his flock spiritually. The minister must preach high ideals and practice what he preaches. If I want my neighbors to clean up their back yards and alleys, I must first put my own in proper shape. Then I can talk to my neighbors about the beauty of clean premises and tell them about the enemies of health that are lurking in filthy slop barrels. Let us first clean up our own back yards and then we will be ready to take up and push the Illinois campaign, that the people may be enlightened. We will then be ready to join in the campaign to get suitable text-books into the schools. It is my opinion that a campaign of this kind would do more for the great majority of children than any other one thing. If you make a man out of a boy, the foundation must be laid in early life. The influence of the home and the school is what counts, and as there is no real home life in a great many homes in every community, it follows that the only way we can reach such children is through the schools. The state says that children must attend school till they arrive at a certain age, and as the great majority of boys and girls never get beyond the graded schools, they should receive while here practical instruction. In many instances their minds are burdened with many things of questionable value to the exclusion of subjects that would prepare them to fight the battles of life. If the State insists, and she certainly should, that a child must attend school up to a certain age, she should see that the child is in a condition to do the best work possible. A boy or girl with a filthy mouth, containing a number of diseased teeth, is not only incapacitated for mental work but he is in a condition to contaminate the air of the whole room with disease germs. The future of the State rests upon the children of today and tomorrow. This being true, the State should insist that the child be made physically as well as mentally strong.

If we will stand together and unite with the National Association and other State Associations, insisting that a suitable text-book on physiology and hygiene, containing a number of chapters on oral hygiene, be introduced and properly taught in the schools, if we can impress the fact upon the State and induce her to act according to the impression, that she can save money, save lives and make life worth living for thousands of her subjects by caring for the mouths and teeth of those who cannot do it for themselves, we will confer a lasting benefit on the race. Then there will be no question as to our standing in our own estimation and in the eyes of the people.

#### DISCUSSION.

N. S. COX, Richmond: A paper of this kind I have found to be very hard to discuss, because when you broach the subject of ethical conduct, every man has his own rule. He applies it to himself, whether he tries to apply it to somebody else or not. However, I like the general character of the paper because of its high moral and professional tone. Any paper which undertakes to make a comparison between the



dental and medical profession always is inclined to raise the question of the standing of the dentist in his own community.

The idea that a degree confers any merit or establishes any standing in the community was exploded a great while ago. We stand just exactly where our characters and our ideals find their level. It used to be that the doctor and the parson were the only educated men in the community, but this has practically been reversed in the past few years. Almost anyone these days can get to be called a doctor, if he has the time and money. Every one of you know men who were excellent farmers a few years ago, who are now very indifferent dentists and doctors. We know the kind of service they are giving, and we know how they got there. It tends to make the public very skeptical as to any merit conferred by degree. Some time ago a well-known Irish wit was riding into our city of Richmond with a friend, and at a little town approaching Richmond a very well dressed, dapper young man, carrying a leather case, sat down in the car in front of the Irishman and his friend and engaged them in conversation. The Irishman asked the young fellow what trade he followed, and he said, "I am a doctor." Like a shot, the Irishman asked, "Hoss or corn?" So it is, when we are introduced to a doctor we begin to speculate as to whether we must discuss philosophy, horses, teeth or toes.

A few years ago it was my pleasure to spend a little time in England, and while I didn't find very many things I would care to bring home to be of benefit to the dental profession, yet there was one thing that pleased me, and that was the plain "Mister" by which the dentists were addressed in their profession. We stand just where our ability places us. We cannot hope in our relation to the public to be recognized as other than mechanics, if we are mechanics, and just so long as we treat abscessed teeth and fill root canals for a fee of one dollar, and give only a dollar's worth of service, we cannot hope to be rated very high in the healing art.

There is one thing in our relation to the public that I think we often fail to realize, or forget, and it was not mentioned in this paper, and that is our manner of treating individual members of that great public when actually operating upon them, not when standing here and theorizing about that operation. The deplorable dental conditions today are not due altogether to the lack of knowledge or the lack of appreciation as to the importance of the cause, but are due to the fear of the dentist and fear of his operation. Too many men have very fine theories as to how operations should be performed, but have no patience with the individual patient they are actually working on. They forget they are human beings, and are apt to treat them as if they were wooden Indians. Many of them do not need any instruction as to how they are to retain their teeth, but if they find that the operator is careless or inconsiderate and causes unnecessary pain in that operation, it does not matter how much instruction they have been able to get, they immediately lose interest in having that work done.

To illustrate the point I am trying to make, I have been in close connection for a number of years with two dentists who have followed different ideals in their practice; one of them started with many handicaps, physically, financially and otherwise. He has always kept before him the fact that the teeth ought to be handled with just as much care and consideration as the eye, and that a patient who is a bundle of nerves practically all the time, must have full consideration. He has handled those patients with the greatest care, and has used every method of avoiding pain, and has been willing to take time to avoid pain, and has always received good fees for that time. Every available moment of his time is in demand, and the common report of that particular man is that he is the kindest and most considerate man, and the most skillful and busiest in his profession in his city. I have heard frequently from little boys and girls, and from big boys and girls, that they really enjoy a visit to his office.

The other man started with many advantages over the first man, physically, financially and socially, but he very early lost his consideration for the patient and ap-

parently adopted the motto, that the faster we work, the quicker we get through. He didn't seem to realize the necessity of being careful. As a result of this that man's practice deteriorated very considerably, and he is now extracting teeth and cleaning teeth for fifty cents, and nervous patients shun him as they would the plague. They submit to extraction simply because they are afraid of an operation. The dental profession is only an aggregation of individuals, and the success of the first man means not only his prosperity, but that hundreds of men and women are saving their teeth, who otherwise would not. I believe that the first man has gotten very nearly in his right relation to the public.

Over in Richmond we carried on last year an aggressive newspaper campaign, and the individual members of our local society paid for that space at advertising rates, and I have no doubt a great deal of good was done. I am heartily in favor of the Illinois, or any other plan that will bring results, but I do want to drive home just this one point, and that is that all the preaching and teaching and the newspaper campaigns in the country won't accomplish the result that we want unless the individual members of the dental profession get in their right relation to the public during the actual performance of dental operations. It is only by giving a sense of relief and benefit to the patient in frequent visits to the dentist that we will be able to enter upon that great field of prophylactic work which is our real hope for the future.

J. H. MORRISON, Connorsville: There is a wider field uncultivated in the dental profession perhaps than in any other profession that we have. In his very first paragraph Dr. Strain says something about man's largest and best duty to the world. I have some notion about that myself. I have some notions about the greatest and best gift man can give to the world and what the world ought to pay him for it. If the present campaign that I understand is started among you makes it easier for the average man to give to the world his best work, without posing before the world as a public benefactor or without sacrificing the reward that is his due, then I can say that you are certainly accomplishing something. But there are dangers before you and possibly disappointment. For five and twenty years I have heard you talk about the ethics and the dentist's duty to his patient and to the world. I have no criticism to make upon the thought, but the old decree was that the practitioner should content himself with giving careful attention as a teacher and as an operator to the people that called upon him, and some years ago it would have been called unprofessional to resort to advertisements of any kind. And now, after all those years, we are told that only five or six per cent of the dentistry that ought to be done is done.

My notion about it is that there is some mistake somewhere in the reports that are given us. I believe that we are reaching a much greater per cent of the people than reports show.

Dr. Strain says that the profession is not doing its duty toward the child. I think that is true, the dental profession today is not doing its duty toward the child. But there is another side to this, too. The child is pretty hard to handle. I have never heard but one man in this society say that he would rather work for a seven- or eight-year old child than for a man. Dr. King told me that one day, and if that is true it is an admirable characteristic in the man. If this great amount of people who never hear of the benefits of dentistry are to be saved by it, the work must begin with the child. And that brings us to this thought. We are not as well qualified to handle the child, either with our instruments or with our knowledge, as we are to handle the adult patient. Most of our work depends upon conditions. There are some things we can do under proper conditions that we cannot do otherwise. There is much need of improvement in our mechanics and methods of practice before the child will be very largely won.

Again Dr. Strain says something about health. Is it worth while to stop here? Health theories are not only given large place in the discussion of dental societies but are very prominent in the general literature of the day, and a thousand theories going over the world, all the way from eating nothing for fifty or sixty days down to eating

raw food, but there is one thing they all agree on. Dr. Kellog says eat nothing, somebody else says eat this sort of thing and that sort of thing, but they all agree on the prime importance of mastication. I do not know but what that is a good slogan for us to adopt—mastication is the safeguard of a man's health. But he can not masticate without teeth.

Dr. Strain threw out another suggestion there. He said something about honesty. Now, we old fellows don't need any admonition of that kind, but some of you younger fellows may need a little admonition. Don't short-cut on the root canals on hot summer days or slip too many gold caps on teeth that need only a filling.

I was not here yesterday when you discussed the Illinois campaign. That may be the way out. I am going to subscribe for that campaign. They all tell me it is good, and if there is anything good going I want it. I tried writing unsigned articles for our paper and a friend of mine said, "Why don't you sign these things and put them in the paper?" It is just the thing we want.

Another thing about the teaching in the public schools. I suspect I am pessimistic. I think that the proper method lays in the training of the teacher, to be an instructor in ethics, cleanliness, and the refinements of life along all lines.

F. W. DAVIS, Jeffersonville: I had not intended to talk upon this subject, because the hour is getting late.

We know that this is, as the last gentleman has said, an old idea in a new form. The trouble has been for a number of years that the dentist has not been doing his duty to his patient, and why? Because the average practitioner is in the habit of putting in three or four amalgam fillings for fifty or seventy-five cents apiece and then throwing in the cleaning. The whole subject resolves itself down to this one point. If you want to do the proper thing for your patient, the dentist must be paid for his services, and the sooner you get down to charging a good fair fee for the time spent the sooner you will be doing your duty to your patient. That is the one strong point that I wish to bring out.

In regard to this widespread movement at the present time in regard to the care of the teeth of children, while the gentleman who spoke last thought that the percentage rate was not quite high enough, if you figure up that out of the thirty thousand dentists practicing in the United States no one man can attend to over five hundred patients, and you multiply that by your thirty thousand, what have you got? You do not have to examine the teeth of the children in the public schools to find that out. The examination of the teeth of the children in the public schools of Chicago shows that not over eighty per cent of the teeth of the children of Chicago show any attention whatever. If that is true of Chicago, it is true of every other locality.

As to the idea of a man standing back for fear of criticism, he is not doing his duty to himself. He wants to be above criticism to do this thing in the proper way.

One of the gentlemen who spoke said something of the financial aspect of the thing. That thing is the only thing you can bring home to your community. The school board is dependent upon the municipal authorities for its appointment or election. If you go before the authorities of that school and show them that by the expenditure of a little money on the care of the teeth of those children in the schools you can reduce the expenses of that school, taking the child whose teeth are not cared for—he is in school from one to two years longer than the one whose teeth are in good condition—if you bring before them the financial aspect of this thing, I think you can very soon convince them.

Closing by DR. STRAIN: As there is considerable business to be transacted before we adjourn for luncheon and as the hour is now here, I will not take time to refer to the points brought out by Dr. Morrison and others; however, I want to say, in addition to what has been said, in the discussion and to emphasize what I said in regard to text books on physiology and hygiene in the schools and the teaching of the same, that The Illinois Campaign is a grand movement and will reach a great many people, but many



parents and children never read the newspapers, therefore they will never know of the press campaign, but all children are compelled by law to attend school. If physiology, hygiene and oral hygiene are properly taught in school, the children will learn something about the value of clean mouths, good teeth and clean bodies. These subjects are not properly taught in the schools of our state as yet.

I have a boy in the 8th grade. The only instructions he received in regard to these subjects was two lessons a week for one-half year while in the 7th grade. The subject of the most importance in regard to the future life and health of the child is passed over as of little value.

To show you the results from a little judicious instruction by one who takes a pride in her pupils and her teaching, I refer to one of our grade teachers. She took it upon herself to examine the children under her care once a week as to the condition of their teeth, hands, and faces. The result was that a great many children visited the dentist to have their teeth cleaned and put in good condition, that they might receive good grades. While doing this primarily, that they might make good grades, they were instructed by the teacher and the dentist in such a way that will no doubt cause them to place a higher value on their teeth. If one teacher, giving only two hours a week for only one-half year, out of eight, can accomplish so much, let us see that the schools are supplied with proper text books and that more time is given this important subject.

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## MOUTH BREATHERS

By Paul DeVerges, D. D. S., New Orleans, La.

IN THE battle waged relentlessly against diseases that afflict humanity, to be able to subdue and cure a malady is a worthy victory indeed, but is it not a grander victory still, even if more easily won, to prevent that disease from gaining any foothold in the body and inflicting suffering and deformity?

The subject which I have the honor of considering with you this evening I have selected after much thought, as being one of equal interest to the dentist and rhinologist, and hence one of the material links that bind the two professions together. All discussions tend to corroborate that only two-sevenths of the cases of dental irregularities could be attributed to naso-pharyngeal etiology, while the other five-sevenths would be derived from other causes. Realizing the baneful influences that follow the deformity of dental arches, especially that condition known as contracted arches, which is undeniably associated with respiratory obstruction, we are confronted with a condition that is not altogether pleasing to our aesthetic sense. The conditions so closely allied to obstructed nasal breathing are adenoids, with which 90 per cent of mouth-breathers under the age of 12 years are afflicted: also hypertrophied tonsils, enlarged inferior turbinate bones, deflection of the nasal septum, polypi, etc.

The alarming number of such patients was powerfully illustrated when the Medical Examiners of the public schools of New Orleans made their first examination and found a preponderance of mouth breathers. It is appalling to look back and consider the fact that this condition has been existing and the resultant deformities still in existence.

It is the bounden duty of the practitioner of dentistry to investigate and find out from all children under his care whether they are suffering from any of the diagnostic signs of impaired mouth breathing, and if any should exist to refer them immediately to the care of a competent rhinologist for treatment. It is important that a diagnosis be made as early as possible, thereby probably preventing any marked contracting arches. Parents, however, are sadly prone to overlook or undervalue in their children the symptoms of these conditions which in the eyes of the rhinologist and the dentist should have most serious purport.

That the most frequent cause of nasal insufficiency in children is the presence of adenoid vegetation in the naso-pharynx is universally accepted. In this connection, also, we must not overlook the frequent co-existence of hypertrophied faucial tonsils, which affect in no small degree the normal nasal respiration.

Next in frequency to adenoid growths we may say is obstruction due to mal-position and hypertrophies of the nasal septum. The first and inevitable effect noticed as a result of these conditions is the habit of mouth breathing, either complete or partial.

Admitting, then, that mouth breathing is a natural and inevitable consequence of nasal insufficiency, we must proceed to investigate its evil effects, especially in regard to their influence to the arches and teeth. When the mouth is open the tongue lies in the inferior maxillary and is not in contact with the hard palate, with the result that the lips and buccal muscles act abnormally, causing a contraction of the arch. (Quoting Dr. Angle.) In the effort of breathing the upper lip is drawn upward and fails to develop in size and function and having hardly any restraint on the labial movement of the incisors their protrusion becomes more and more pronounced, partially as a result of pressure from the tongue and narrowing of the arch, but principally because the lower lip is so frequently forced against their lingual surfaces in swallowing and in the effort at moistening the mucous membrane of the mouth. Both upper and lower incisors become lengthened, probably from lack of functions, so that the occlusal edges of the lower are frequently in contact with the mucous membrane of the upper, giving to the patient a vacant look.

The theory of heredity, I dare say, as applied to these malformations has no supporters. While it is true that several members of a family may show a tendency in this direction, yet I dare say that most of them can be proven to have nasal obstructions as an exciting cause. We know also that adenoid vegetations, causing nasal obstructions, not infrequently occur as a constitutional trait in several members of a family. In conclusion I desire to reiterate my remarks in regard to the great importance of free nasal respiration in childhood and of the early recognition and treatment of conditions that produce nasal insufficiency. We should always bear in mind that the ability to recognize a condition that may lead to disease or deformity bears with it a moral responsibility to which we should never be indifferent.

## REPORT OF PUBLIC PRESS COMMITTEE\*

By F. R. Henshaw, D.D.S., Indianapolis Ind.

I AM NOT going to read a paper, but I just want to give a little report of what has been done by the Public Press Committee. It might be well to give a short account of what this movement consists in.

In the first place a committee was appointed by the Illinois State Dental Society, having for its object the institution of a campaign of public education through the press of the state of Illinois, and Dr. C. B. Warner of Urbana, Ohio, is the chairman of that committee, Dr. C. W. Johnson is a member, and several others, the names of whom I cannot now recall. They formulated a plan something like this: They are to have a series of articles ranging in number from twenty-six to fifty, on the care, proper attention and preservation of the mouth and teeth. These articles are to be written by men who are capable of writing proper articles that will come in touch with the intelligence of the public and are to be published simultaneously throughout the states of Illinois, Indiana and Kentucky by this Public Press Committee. How they do it is this:

This committee has made arrangements with a publishing firm which will put this matter up in the form of newspaper matter adapted to editorial or first page stuff. These articles are half-column articles and will be simultaneously distributed to all of the newspapers in the towns where the subscriptions come from by this publishing company gratis to all of these papers except in the case of large cities. In the large cities, using plate stuff is not permissible on account of union labor, and in consequence copy of this will be sent to them and set up in the regular way. This is not patent inside material at all. It is not going into the inside of these papers. It is first page, or middle page, or editorial page stuff, and there isn't any question at all about the papers taking it. They are more than glad to get it. They buy the same thing from the publishing company for a dollar a column. We are going to give it to them for nothing.

A word as to how Indiana got in on this. I have been informed that there has been a little misapprehension in various parts of the state as to the position of myself as the chairman of the committee on public press, the supposition having been arrived at that the usurpation of the rights of the Oral Hygiene Committee of the State Society had been intended. This is not true. I was appointed as a representative of the state of Indiana by Dr. Warner, chairman of the committee for the state of Illinois, and therefore it had nothing at that time to do with the State Society of Indiana. However, my appointment as the chairman of this committee for the state of Indiana was indorsed by the Indianapolis Dental Association, whose members unanimously subscribed to this campaign, and then the president of the Indiana State Dental Association took it upon himself, in the absence of the board of trustees, to also indorse me as the representative

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\*Read before the Indiana State Dental Society, 1911.



and the chairman of the Committee on Public Press. (I just want to correct the statement I just made.) Dr. Lucas tells me that he secured the consent of the board of trustees before making this appointment. There was no usurpation nor any desire to usurp any of the rights of the Oral Hygiene Committee, this campaign being carried on entirely separate.

I must say that the plan has met with the most welcome reception. I have received scores of letters from all parts of the state, from the dentists in all of the towns, practically, voicing their support of the campaign and stating their views in the matter, all of which were favorable, and while my general letter was only sent out a very short time ago, the responses to it have been more than satisfactory. We have now subscriptions to this campaign of practically three hundred dentists over the state of Indiana, and these from over fifty cities and towns. Now, of course, that does not begin to cover the state, but that is the start that has been made in about two weeks' time after the sending out of my circular letter, and we expect at this meeting, if not to receive your applications, at any rate to interest you in this matter enough that when you go home you will not only see to it that your application is sent to me, but that the application of every other dentist in your town or city will be sent.

For instance, we will take the city of Evansville. There are thirty dentists there. Yesterday I received the applications of twenty-two of these. That is a good representation. The number of dentists in Fort Wayne is forty. I received twenty-five applications from Fort Wayne. We expect in Indianapolis, before we get through, to have not less than one hundred. I think we will have more, because we have some live ones working on it. I am not doing all of this. I could not do it, it would be impossible. But I have had the co-operation of all the fellows all over the state. For instance, I was writing to Dr. Dinwiddie one day and I incidentally remarked to him that I would like to have him take this matter up. Today he brings all of Lake county. And that is the way we will have to bring this up. Dr. Eggleston, of Warsaw, went out and in one hour secured the subscriptions of every dentist in Warsaw. It is up to you fellows here to get busy in your own towns. We will say now that you live in a town where you are the only dentist. If you send in your subscription and the name of your local paper we will get you the service of at least twenty-six articles. If there are two dentists and both send in your subscriptions, we will get you thirty articles, etc., etc. If there are six dentists in the town, I do not know exactly but I presume that six dentists in a town will get the full fifty articles. I believe that is true.

Now don't say, "Well, there is So-and-So, I know he won't do it," and then never say anything to him about it. Put this matter to him and show him that it is going to be an advantage to him and to every person in the community. The first advantage of this is necessarily going to be to the public. That is the prime idea of this campaign, the education of the public up to the proper ideals as to the care of their mouths. The next thing, a selfish one, is for our own advantage, and it is estimated by the

committee in Illinois that this campaign in the state of Illinois will increase the practice of the dentists of Illinois on an average of more than twenty-five per cent. I do not know how they get their figures, but you can see that it will increase it, and it is going to help the public.

These articles, as I said, are half-column articles. They will all be censored by Dr. C. N. Johnson of Chicago. They will be popular articles that the public will be glad to read and to listen to, and they will be sent out simultaneously. They are sent out under a system used by newspaper offices known as release dates. For instance, if you are operating a paper in a certain town, the copy for these will be sent to you with a certain release date, which means that you will not publish it before that particular date. In that way every paper will have the opportunity and privilege of publishing these at the same time with all other papers in the state. One paper will not have these articles a day, or a week, or a month before another paper. Consequently, all of the papers will be willing and glad to get it. They would not take it, of course, if it was published over here last week and the papers over there didn't get it until this week. They wouldn't take it then, but they are all to have it simultaneously, and they will be glad to get it. You need not worry about it a minute.

And don't bother about going to see your editors. The committee will take care of the editors—not primarily the committee, but the press association which publishes the stuff will take care of the editors.

If there are any questions anyone would like to ask about this campaign, I will be glad to answer them.

There is one other matter. This publication will begin on the fifth day of July. That date has been definitely set by the committee from the Illinois State Dental Association. Consequently we must have all of our subscriptions in to them in time for us to begin at the time named. Now, in order to do that it is going to be necessary for all of the applications to be in my hands by the middle of the month of June, because it will take some little time to get the arrangements made with the committee of the Illinois Society and for them to make arrangements with their publishing company. So we want you to get busy on this thing. I am satisfied that everyone is going to be interested in it. In fact, I have had so many letters from people who are interested that I wonder about anybody that isn't so. I believe it is going to be possible to get this absolutely widespread over the state of Indiana. For instance, the town of Shelbyville this morning brought up the application of every dentist in the town. That is true of numerous other towns—Wabash, North Manchester, Peru.

**“Take your time, but keep your hands off the time of busy people.”**

## REPORT OF EDUCATIONAL AND ORAL HYGIENE COMMITTEE\*

By S. B. Hartman, Chairman, Fort Wayne, Indiana

YOUR COMMITTEE would respectfully make the following report: Since our last meeting I have personally been diligent in the performance of duty whenever I had an opportunity. In June I attended the Northern Ohio Dental Association at Toledo. And on the evening given to Dental Education I addressed the meeting, referring to what had been done in our state, and the expectations of the future. During the year I addressed the meeting of the county teachers in Fort Wayne. The superintendent of the county schools was in attendance, and I am confident much good shall come from this talk in the way of teachers giving more attention to instruction to Oral Hygiene in the county schools.

During the past winter the dentists of Fort Wayne organized a society for the purpose of dental inspection in the city public schools. Dr. S. B. Hartman was chosen president and Dr. J. W. Autenreith, secretary, and Dr. J. W. Thompson chairman of committee to confer with the school board.

This committee subsequently reported to the society that permission was given to conduct dental inspection at the Jefferson school. As there was no provision whereby the school board could employ an inspector, the following named dentists of the city personally contributed a like amount, each to employ an inspector, and Dr. S. B. Hartman was unanimously chosen to conduct the examination.

## DENTISTS CONTRIBUTING

Dr. G. R. Courter	Dr. J. W. Thompson	Dr. L. S. Tucker
Dr. O. Meyer	Dr. H. L. Porter	Dr. R. S. Viberg
Dr. J. W. Autenreith	Dr. T. C. Wyneken	Dr. J. R. Harrington
Dr. G. E. Johnson	Dr. J. W. Williams	Dr. H. W. Pierce
Dr. E. E. Quivey	Dr. Merrill Ivins	Dr. S. B. Hartman
Dr. J. A. Williams	Dr. M. A. Mason	Dr. Hendrickson
Dr. E. R. Burket	Dr. W. W. Shryock	
Dr. Hilgeman	Dr. J. S. McCurdy	

The day previous to commencing the dental inspection, Dr. J. W. Thompson and S. B. Hartman gave an address to the principal and teachers of the school, pertaining to the object of the examination. Also during the week of the inspection Dr. M. A. Mason addressed the teachers and pupils on oral hygiene and the care of the teeth. On the afternoon of the last day of the inspection Dr. G. E. Johnson gave an illustrated lecture on "Tooth Development and Orthodontia."

During the examinations a number of the city dentists visited the school and were present at the inspection.

\*Read before the Indiana State Dental Society, 1911.



Professor Study, superintendent of the schools, and Professor Miles, principal of the Jefferson school, were greatly pleased with the results of the inspection, and that both parents and pupils approved and encouraged the same.

The following is the report pertaining to the inspection:

FORT WAYNE, IND., Feb. 28, 1911.

*To the Fort Wayne Dental Educational and Oral Hygiene Society.*

GENTLEMEN: I respectfully report the dental examinations of the pupils of the Jefferson school of this city as follows:

Pupils having dental examinations.....	404
First permanent molar teeth decayed.....	274
Permanent teeth other than first molars decayed.....	198
Temporary teeth decayed .....	696
Teeth out of position .....	364
Teeth that have been filled .....	179
Pupils needing teeth cleaned .....	87
Pupils who use tooth brushes.....	234
Pupils having teeth in perfect condition, not having had dental work, or any needed, in regular grades.....	3
Kindergarten pupils with teeth in perfect condition.....	1
Pupils with teeth in very good condition.....	84
Pupils with teeth in very bad condition.....	39
Children in kindergarten with teeth in excellent condition.....	7
Dental examinations for children in kindergarten.....	22

#### REMARKS

The teeth of the pupils of the 8A grade had the best general average for teeth in good condition. In this grade special attention has been given to the care of the teeth in the way of the use of the tooth brush and the care of the dentist.

The number of first permanent molars showing decay is large; this is no doubt due from parents mistaking them for temporary teeth, as they appear at the age of about six, and no temporary teeth are removed for space, the teeth erupting back of the last temporary tooth.

I am pleased to observe the large number of pupils using the tooth brush, more than half of whom have their teeth examined.

I feel that the results from this dental examination will in the future be for the good of the child, in health and comfort and in many ways.

I appreciate the kindness shown me by the dentists of the city in the way of talks to children on the care of the teeth during the progress of the examinations. I also would say the principal of the Jefferson school and the teachers and pupils kindly helped in the work.

The examinations closed Friday, February 24th, with an illustrated lecture on the eruption and care of the teeth. The slips showing records of examinations have been given to the school principal for distribution to the pupils.

Respectfully,

S. B. HARTMAN.

Since the close of the dental inspection in the Jefferson school at Fort Wayne the principal has kindly sent me the following letter, which I am pleased to include in my report:

## JEFFERSON SCHOOL

F. W. MILES, PRINCIPAL,

FORT WAYNE, IND., May 12, 1911.

Dr. S. B. Hartman,

Fort Wayne, Ind.

DEAR SIR: I wish to express my thanks to you for your very valuable services to our school during the dental examination of children you conducted here. Your careful work, sympathetic attitude toward children, and strictly sanitary methods made the examination of the greatest value. The fact that you conducted the work free from any commercialism in the way of attempting to turn work to any particular dentist rendered it perfectly satisfactory to the patrons as far as I know.

From inquiries I have made I find that the reports you made concerning the condition of the teeth of many pupils have resulted in the work being done since.

While I consider that such examinations prove of great help to a school, yet I think of how much *more* could be accomplished if our laws *required* the examination and *provided for the treatment of teeth free of charge*.

When that condition comes I will expect to see a decided improvement in the *general health* of pupils and consequently a great improvement in their *school work*, for I am confident that many pupils who now have poor digestion, poor blood, and do poor school work are made so by *defective teeth*. The one thing needed to make *your work* and that of our *medical inspector* count for *most*, is a law that will *compel* the defects that you report to be *treated*.

Very truly yours,

F. W. MILES.

During the year I have written a number of personal letters to dentists in the state, urging them to organize Dental Hygiene Societies for the purpose of dental inspection in the public school, and I am pleased to say the outlook is encouraging, and I feel that Indiana is ready and anxious to do all possible for this great help to humankind.

Fraternally,

S. B. HARTMAN, *Chairman*,

Fort Wayne, Indiana.

## DISCUSSION HARTMAN AND HENSHAW PAPERS

GEO. E. HUNT, Indianapolis: I want to explain first of all what we attempted to do this winter in the legislature. I don't believe your president knows anything about it, at least he didn't say anything about it in his paper this morning.

Last winter just before the legislature met, the State Board of Education and State Board of Health got together and drew up a bill for a compulsory medical inspection law. That means that the inspection of the school children would have been compulsory had the bill been passed. After they had the bill in the shape they wanted it, Dr. Hurty brought me a copy and said to me, "Do to it what you will and we will try to pass it." Well, I went through the bill and every place that read "medical inspection" I put in "and dental," and every time it said that the child would be referred to the family physician I put in "and dentist," and I had a bully bill. At Dr. Hurty's suggestion the inspection was to be permissive, not compulsory, because

he thought that was the best we could get at the start—permission for the school boards to appoint dental inspectors.

Now, all of these bills that the State Board of Health tries to get through have to be under the guidance of a committee, and it happened that the particular committee that this bill was referred to had Senator Will Wood as its guiding star. They threw several kinds of fits when they saw the reference to dental inspection in the bill. Dr. Hurty and other members tried to convince the committee that the bill was all right, but the committee said they would not be responsible for the bill if it was left in that shape; so we had to cut it out, and finally they cut out the compulsory medical part and left it a permissive bill—it permits the various boards of education to appoint medical inspectors only.

These things always move slowly. I think in two years from now the medical association will probably be able to get through a compulsory medical inspection bill, and at that time perhaps we can get permissive inspection by dental inspectors, and in another two years we may be able to have that compulsory also. The next step will be medical and dental nurses. We have to educate the public before we can get them, or we have to educate the representatives of the people, and they are sometimes a little slow to educate.

I want to tell you some of the things that have been done here in the city in the way of advancing the work. The State Board of Health has promised that the next inspector they appoint will be a dental inspector. They fall back on the old excuse that they are broke for not appointing him right away. I think we can get at least one dental inspector appointed in the fall. In the meantime I have lectured at about fifteen of the public school-houses and expect to continue that work in the fall, and I have lectured before the school teachers' school here. I gave a talk before the representatives of the State Boards of Health last Thursday. I have been over to Wheeling, West Virginia, and opened their campaign on oral hygiene for them there. I am going to go to Noblesville a week from tomorrow. So you see that we are not asleep on the job here in Indianapolis, and I do not want you fellows to think that you are the only ones that have been doing anything.

There are three ways by which the public can be educated in this oral hygiene work. One is from the platform. Another is by exhibits, and the other is by press publicity.

Dr. Hartman has told you in his paper about the platform end of the work, and that is a very important part, lectures to the public, to the school children, and to the teachers.

Next is the exhibit question. We have but one dental exhibit in the State of Indiana, and Dr. Hurty bought that at my suggestion. This exhibit was shown first at Fort Wayne in connection with the tuberculosis exhibit of the State Board of Health, and that exhibit is now going all over the state. Wherever the State Board of Health's tuberculosis exhibit is shown, is shown also this dental exhibit. He tells me that he will be willing to loan it to the city schools after a while, and we will have it for a couple of days in each school, and especially in those schools in which I gave the talks.

What I want this association to do is to order the Board of Trustees at this meeting to authorize the expenditure of a considerable sum of money, not more than two hundred dollars, on an exhibit. I think we can get a very good exhibit for about a hundred and twenty-five dollars. I think the State Society ought to buy such an exhibit and leave it at some central point, and then let that exhibit be loaned by this State Society to any responsible body of men and women in the State of Indiana who wish to use it. I would not confine it to dentists by any means, but to any responsible body of men or women in the state who are going to have an exhibit or talk upon public health. I would say, let us loan that exhibit to them if they will pay the express on it both ways. I suggest that it be kept here in Indianapolis, where it will be



easier to get it to other parts of the state. I will take the trouble of all that if the State Society will authorize the buying of it.

The last thing that is important in this oral hygiene work in the education of the public is the use of the public press. I do not know that I can add anything to what Dr. Henshaw has said, but I think that all of you who have not availed yourselves of this opportunity will be very sorry. After this publication campaign once opens it will not be so effective for those who are not in on the start, because after fifty or sixty county seats have had these articles in their papers, your county seat paper will be a little slower about publishing them, if they come to them a month or two afterward. Therefore, I advise you all to get in on the start.

The expense of this is nominal, as you know. In the towns where there are only one or two dentists the committee is going to lose money, and it is only in the larger places where more dentists respond to the appeal that they are going to get money enough to make up for the loss in the smaller places, so it is important that we try to get all of the dentists to come in and contribute that \$1.50. It is little enough to pay for the service.

You might be interested in the work that is being done up at Cleveland. I was there at the final test given in the school in the Ghetto quarter, the place where the Jews live. There were six hundred and forty odd pupils. That is the school in which the inspection was made by the dentists of Cleveland, because it was about the worst school in Cleveland. They selected forty of the worst children, and I am sure you would have thought them very bad. They all were retarded pupils, back in their classes, nearly all of them bad children, some known as incorrigible children, that the truant officer had to go after, that the teachers dreaded to see come into their rooms as they passed from one class to another; about the worst you ever saw. The dentists made up a purse of money and told them they would give them five dollars each if they would stick to the rules for six months. First five dropped out, and one after another dropped out until they wound up with twenty-eight. They kept up this work for almost a year. They first put their mouths in as good condition as they could put them. They didn't do much gold filling nor crown work, but they cleaned up these mouths perfectly. They taught them how to clean their mouths and invited them out to dinner and taught them how to chew their food. Then they had a dental nurse appointed by the State Board of Health. That nurse visited these children in their homes once a week, or once every two weeks. They kept close tab on them. Before they did any work on them they gave them memory tests and addition tests, and other tests devised by the teacher of psychology, and every one or two weeks they would give them tests. I was there at the final test, and the twenty-eight who had stuck did some wonderful work. First they put before us a piece of paste-board that had ten rows of numbers on it. They held that up before us for forty-five seconds. Then they removed it and gave us sixty seconds, one minute, in which to write down all of those series of numbers that we could remember. I wrote down six, but there were many of those twenty-eight children who wrote down the ten of them. Then they had a large number of columns of figures to add, thirty-six columns with about fifteen numbers in a column. I added sixteen, just got through the first row. One child there added the sixteen and eight on his second row, and practically all of the children beat me. They gave them memory tests of various kinds and it was very interesting. I then inspected their mouths and they were just as clean as could be, and they were taking a great deal of pride in the care of their teeth. They were a healthy lot of children and their school records were admirable. Where they used to be truants they are now constant in their attendance. Their school efficiency has increased over fifty per cent. for the entire squad.

We are spending thousands and thousands of dollars every year for caring for retarded pupils. Almost eight per cent. of our white boys and girls are retarded pupils. It costs thirty-two dollars a year to educate every pupil in the city of Indian-

apolis. We have over thirty thousand pupils in the city schools. It is simply a matter of mathematics. If you will take eight per cent., the retarded white children, of every thirty thousand pupils, and multiply that by thirty-two dollars, you will find out how much we are paying every year to carry these pupils along. It amounts to about Twenty-five Thousand Dollars a year. This one experiment put through at Cleveland would indicate that we can save a great deal of that money if we put their mouths in a hygienic condition. Other things have to be done, but it is one of the very important things. We have to look after their eye sight and hearing, and the condition of their noses and throats. All of these things taken together would reduce the number of retarded children very materially. I want to see that experiment duplicated in many cities in the United States next winter. It is going to be done in Indianapolis.

I want to tell you a little hope that I have for the Fall. I am editing a magazine that I suppose most of you have seen and read, and it has been suggested that we get out a laity number, and if the publishers can see their way clear to do it without going into bankruptcy they are going to do it. In it we will have an article fit to be read before little children, one they will understand, and other articles that can be read by children a little older, by the school children, another for school teachers, and even for physicians' societies. The idea will be that we will try to put this issue very largely in the hands of people who are interested in this work, so that the teachers may read the articles in their schools, and that you can get your county medical societies to read the one intended for them, etc., to get the laity in touch with the work being done.

There never was anything to equal the far-reaching effects of this oral hygiene movement. You will feel it in your practice in a short time. In fact, I don't know where the dentists will come from to take care of the work if it is continued. There are less than ten per cent. of the people today who regularly go to dentists. If another ten per cent. should start tomorrow there would not be dentists enough to take care of them. The only appalling thing about it is that we cannot do the work that is bound to come to us in a short time. It is impossible for the profession to take care of the work that will come in a short time, especially in the matter of these school children. The best we can do is to do emergency work for the larger ones and take care of the mouths of the little ones so thoroughly that in eight or ten years we will have school children with mouths in good condition. The question of reparative work is an absolutely impossible one in eighty per cent. of the school children twelve years of age. The only thing you can do is to look after the very young ones and keep them in good condition as they grow up.

H. C. SEXTON, Shelbyville: I think we have all enjoyed these two papers very much, and there is nothing in either one of them that we can disapprove of, surely. There is one point about the oral hygiene movement to which I wish to call attention. It is going to bring great good to the school children undoubtedly. It is going to bring a greater good to the dentists, and not entirely a money good, either. I mean it is going to bring about a reformation in the dental profession in the way we look after the children.

In the past our work on children has been very bad. We have neglected them. We have been very much like Charles Lamb. A friend asked him how he liked children, and he said, "I will take them fried." There are lots of dentists who will take children fried, but when they are real, live children they haven't any use for them in their practices. The children now will be thrust upon us. We have to take care of them, and it will bring about a reformation in our practice. It will be necessary for us to cultivate patience and tact.

We had an inspection in Shelbyville last Fall and we were very well pleased with our results. We found only two hundred and three perfect mouths out of six-

teen hundred and fifty that we examined. That is about sixteen per cent. In those perfect mouths we included the mouths that had been made perfect by filling. If we had taken out those mouths upon which work had been done and counted only those perfect by nature, I do not believe there would have been two per cent. of them.

We had some trouble and met with some opposition. We intended at first to use the dental chairs, but they were too bulky and finally we just used the plain office chairs, and the child would lean its head against the back or on the arm of the dentist. We would have found twenty-five to thirty per cent. more cavities if we had used the explorer; but we had the idea that if, when inspecting the mouth of a frightened child, we should hurt it and it should cry out, all the other children would be frightened and we would be handicapped in our work. After the examination was concluded we had a very eulogistic letter published in our home papers by our superintendent of public schools, thanking us for our work.

Another instance to show how the work is appreciated. This was from a mother. A few weeks ago I was at a reception and a lady across the room caught my eye and came forward with her hand extended. She said "I want to thank you for the good you did Elizabeth." I told her I had treated Elizabeth just as I treated the other children who came to me. She said, "It wasn't that, it was the dental inspection you put through in school. By that means you discovered the cavities in her teeth and got them filled before they hurt her. If that had not been done she would never have had as perfect a mouth as now." When an expression like that comes from a mother it shows that we are really in a work of which to be proud.

In order to do the work we formed a local society, which we had never had before, and we got every dentist in the town into it. We called it the Clayton Dental Society, and we could not have found a better man to name it after than Dr. John R. Clayton. It has been a great thing for us dentists, as well as for the school children.

Dr. Hartman is in favor of the paid inspector. That is a good thing, but we cannot have that now. If we had waited in our town we would have waited a dozen years, and I do not think it is right for a man to say, "We will wait until the paid inspector comes before we have dental inspection." It is an ideal for the future, but we are losing time if we wait.

It has sometimes occurred to me that we dentists are throwing lots of stones, and perhaps we are living in glass houses. When we say that a clean tooth cannot decay we are casting a reflection upon anybody who has a carious tooth in his mouth. We are setting ourselves up on a higher plane than the ordinary man. We will be judged in a more severe way. I think we will have to recognize the fact that a dentist who isn't himself an example of oral hygiene is not worthy of being a dentist. I do not believe that a man in practice ought to smoke during office hours. I think it is a very bad thing to do. I do not object to cigar smoke; in fact, I rather like it, but when you have a dentist who has been smoking bend over you and get the smell of the stale smoke, it is another proposition. I do not think a dentist ought to eat onions. A dentist who eats onions and tries to practice over people ought to be put out of the profession.

When it comes to cigarette smoking for dentists, I am a little embarrassed about expressing myself. It recalls a story in Eben Holden. In the neighborhood where Uncle Eb. lived was a fish in the creek that all the sportsmen had tried for years to catch but had never succeeded, and so it came to be called the Old Settler. One day Uncle Eb. was sitting on the cracker box at the corner store when one of the neighbors dropped in and told of his latest experience with the Old Settler. "I was standing on the bank," he said, "when he came along and grabbed my hook and pulled the pole under the water and pulled me off the bank, into the water



under a pile of drifted logs, and if I had not let loose of the pole when I did I would be a dead man now." When he finished the circle was silent and finally the narrator turned to Uncle Eb. and said, "What do you think of that?" Uncle Eb. said, "It really would not be polite for me to say what I do think of it." Now, that is the embarrassing position in which I find myself when I talk about the dentist who smokes cigarettes.

In the matter of the press campaign that we have before us, I believe that every man who is a member of the State Society ought to subscribe. I think every man who is practicing dentistry ought to subscribe, but at least every man who is a member of the State Society is neglecting his duty if he does not. It is our duty to inform the public how to take care of their teeth, and in the past we have been doing it in a very imperfect way. The public press is the greatest force we have in civilization. It interests a dozen men where the church interests one. If you had the power to dictate to any man just what things he should read, you could absolutely say what that man would be in politics, religion and everything else. What a man reads and what he absorbs makes that man. Heretofore we have been neglecting the man that reads because we have not used the public press, the greatest power in the world today. It not only reflects public opinion, it makes public opinion. The public press is public opinion. What have we done with it? We have turned it over to the most degraded part of our profession. We have said to the dishonest element in our profession, "Here is the greatest power we have; you can use it exclusively, we are not going to use it at all." It is a shame when a profession will do a thing like that and it is time we were reforming. We have been living a barrel and bung hole existence. We are now standing on our feet and taking a look all around. It is said that the greatest joy in the world is to put salt on the tail of an idea. Over in Illinois they have been salting the tail of a great idea. I don't know why somebody didn't do this sooner. Nobody thought of it. We have at the head of it here in Indiana a man that couldn't be beat. Teddy Henshaw comes from Middletown, and you can make lots of a man from Middletown if you catch him young.

M. A. MASON, Fort Wayne: I have enjoyed the two papers read, and I have enjoyed the discussions which followed. These are practical questions and questions in which we are all interested. We have just started the work in Fort Wayne, and the one school building in which the children's teeth were examined has proven the value of this work to the dentists and to the pupils as well.

During a conference with the school board we had the assurance that as soon as a law is passed for the appointment of a paid inspector, all of the children's teeth in the entire city will be examined. The work already done was undertaken by a few of the dentists in Fort Wayne, Dr. Hartman doing the work. I am certain that all of those who contributed toward the cause of dental inspection in this one school have found it very highly profitable financially and otherwise. There is more in the satisfaction that this work has met with the approval of the public than that it brings in direct financial returns. I remember the instance of a child who came to me and said, "I heard a talk at our school yesterday." I said "What about?" He replied, "The dentist who talked said that if you take proper pains and clean your teeth and keep them in good shape that you will save a great many dental bills." I saw that he was well impressed. I think we ought to impress upon the children the thought as given by Dr. Montgomery and urge upon them the importance of daily cleaning and thorough cleaning of the teeth; not only daily, but several times a day. I enjoyed the suggestion of Dr. Montgomery when he spoke of the tooth brush brigade, and I believe we would see the value of such a brigade if conducted in our own cities. I have recalled several times a remark made by someone at South Bend last Fall. He said, "You dentists do not realize the importance of this public in-

spection of children's teeth. If the people of the United States could fully realize the importance of saving their teeth, a hundred and fifty thousand dentists would not be sufficient to care for the teeth in this country." I have often talked to the dentists of our city about the few people that we recognize on the streets as those who have called upon us for dental service. It is safe to say that not one in one hundred call on the dentist during the year. If the thousands could be reached who never visit a dentist's office, or who visit the dentist only once in a great while, you can imagine what an abundance of dental work there would be to perform.

The idea of this publication campaign is an excellent one. It will redound to the benefit of the profession and the public especially, in many ways. It will aid dentistry and it will benefit humanity. When you consider all of these things it will be reason enough for us to urge the publicity movement. Also the benefit of it will be financially to the dentists, although little need be said along that line, for most of the dentists are quite busy at the present time. But when we come to the point where a great many children come to us who are not now coming to us, we can see the importance of a phase of the work which we have not come in contact with up to the present time.

In one locality a dentist said he didn't care to work for children. He is making a great mistake. They become our friends and patrons bye and bye. We ought to do it for humanity's sake if for no other reason.

I would like to see this oral hygiene exhibit carried out. I believe if it is properly prepared it will be a wonderful education in itself. So we ought to give this movement our support. Anyhow the experiment with this publicity movement will cost us only a dollar and a half, and it is certainly worth that and many times over. If we don't believe it now we will later on.

W. L. KENNEMAN, Martinsville, Ind.: As to this matter of dental education in the schools and through the press, I feel as Oliver Wendell Holmes once said: "The greatest thing in the world is not where a man stands but the direction he is going." And I firmly believe we are headed in the right direction, even if we are moving slowly.

We cannot expect to accomplish all our ideals in this campaign in one year nor two years; possibly it will take a number of years before we get compulsory medical and dental inspection of the school children. We have done some preliminary work at my town of Martinsville, and so far has proven very successful. This work has consisted in talks on teeth to the school children, stereopticon lectures before the County Teachers' Institute on the care of the teeth; also prize essays on "The Care of the Teeth," in the grades of the city schools. While our superintendent is heartily in favor of inspection, our *school board* has not yet awakened to its great importance, and must be educated to it by degrees.

I am certainly glad that so many dentists over the state have taken such a deep interest in this work and are doing something. While I have done very little, I am certainly proud of the results of what I have done.

J. W. ROPER, Princeton: I just want to tell you a few things that have been done in Princeton. This year was our third year of inspection. This tooth brush brigade we introduced I think is one of the best things we have done. In our first year of inspection we had a hundred and ninety-three who used the brush. This year, out of seven hundred and forty-four pupils, five hundred and twenty-two are using their tooth brushes, so you can see by that we are doing some good.

This work, of course, will be met by opposition, but do not stop at that, as anything that will be a benefit to humanity will be opposed.

I think that Dr. Hunt's suggestion that this association should set aside a certain amount of money for this oral hygiene committee to spend ought to be carried out, and the work over the state of Indiana will be much easier for the

committee. I would like to see this work all over the state and I think if Dr. King's idea of dividing the state into congressional districts is carried out it will be much easier for all of us. This movement is a life-saving movement and it is depending upon the dentists to carry this out, and it is our duty to educate these children.

## O B I T U A R Y

At Mason, Mich., at 5 o'clock on the morning of April 27, died Dr. Aaron P. Van Deusen, from after effects of an attack of la grippe, in January last. His death came as a severe shock to his friends, of whom he had many scattered far and wide.

Dr. Van Deusen was one of the oldest practicing dentists in the state and had been in continuous practice here for forty-six years. Dr. Van Deusen was born in Newark, N. Y., April 14, 1836, and lived in that vicinity until 1864, when he came to Michigan, taking up the study of dentistry in Jackson. Two years later he became a Mason resident and he built up a practice which brought him custom from all parts of the United States.

In 1868 he was married to Miss Mary C. Handy of Aurelius, and three children were born to them: Miss Rena of this city, Claude of Lansing, and Mrs. J. B. Mills of Shreveport, La. The death of the husband and father is the first break in the family circle in forty-four years. He is also survived by a sister in Palmyra, N. Y.

Dr. Van Deusen had been a member of the Presbyterian church here since 1866, and lived the religion he professed. He was highly respected by all who knew him. Not alone have the people of Michigan suffered in the loss of Dr. Van Deusen, but his fellow practitioners share therein and shall sincerely mourn him. He was a conscientious, skilled and faithful member of the profession to which he devoted his life and in which he was a conspicuous figure, drawing practice from many neighboring cities and towns in which he had many friends, all of whom he served faithfully and well.

We join in the respect felt by all who knew him.

JOS. S. HAWLEY, D.D.S.

Mason, Mich., April 29, 1912.

Thousands of people in small positions whine because their talents are thrown away — because their ability has no elbow-room. It is not elbow-room they need; it is "elbow-grease"; it is energy and strength. Their very whining shows they are too small for the place they are in now. When the right kind of a person has too small a place he does his work so well as to make the place bigger.

—Le Baron Briggs.



# CORRESPONDENCE

## PROPHYLAXIS

To the Editor of THE DENTAL SUMMARY:

Dr. Adair, in his December article, says, "It takes a crank to work prophylaxis." The word "crank" is disagreeable and, I think, "enthusiast" sufficiently forceful to describe a very large majority of the advocates of what the doctor is pleased to call "Systematic and Regular Preventive Treatment." The doctor's reply to my article does not read as though it were written by one who has the characteristics of my conception of a "crank."

However, I think the doctor can, without offense to him or error of statement, be considered an "enthusiast" on the subject of prophylaxis. The danger of being over-zealous is that of becoming arrogantly insistent on the rest of the world's seeing things, visible and invisible, through glasses especially adapted to their own visions and to assume an unwarranted autocratic superiority of understanding and conception. These characteristics easily lead them to the arrogation of unjustifiable imperiousness and to set up standards of their own devising, and to proclaim as faults anything that deviates from their own observation or that diverges from the *modus operandi* they dictatorially and intolerantly set down.

Please mark that I said "danger." Dr. Adair's courteous letter exhibits none of these objectionable attributes, though he seems to have misunderstood and misinterpreted much of my letter and read into it inferences which I did not put there. I shall answer his statements in the order in which he made and asked them.

The doctor says that I called his attention to "What I supposed is an error of investigation on his part." Not knowing much of the doctor's work, I was not in a position to *suppose* anything. I merely tried to answer his statements as he made them in his December article and to suggest further investigation. His article gave no indication of a knowledge of what Dr. Mills has done. It could lead a reader to believe only that in nomenclature and practice prophylaxis is of more recent date than the facts indicate. I asserted and tried to prove that his article tended to give a wrong impression.

In the sentence, "Oral Hygiene and cleaning the teeth is a part of the scheme of Prophylaxis, but only a part," and in the rest of this paragraph the doctor seems to be trying to attenuate the definition of the word "prophylaxis" to include more in its meaning than is recognized by the

compilers of any dictionary that I have consulted. It seems to be a case of "using a common word in an uncommon meaning," and the result is sure to be "the sowing of a jungle of misunderstanding." The Century dictionary defines hygiene as "that department of medical knowledge which concerns the preservation of health; a system of principles or rules designed for the promotion of health; sanitary science." It defines prophylaxis as "guarding against the attack of some disease." I am unable to differentiate between "preserving the health" and "guarding against disease." The doctor might have said that cleaning which includes removal of the tartar, polishing, and medication when necessary—is but a part of oral hygiene. I could then very well understand what he means. When he says that "Oral Hygiene and cleaning the teeth is a 'part' of the scheme of Prophylaxis, but only a part," I am in a labyrinth of "twisted wires" and the only pathway I see through his orthodontic maze is that he includes in his definition a *special* method of controlling the patient. I would ask the doctor for his authority. Until he gives it his application is as well defined, to my mind, as the paths of the Atlantic liners. Failing to do so, I think the doctor had better advocate "Systematic Preventive Treatment" as a substitute for his use of "prophylaxis." I take the liberty to omit the word "regular," as it is tautological.

The doctor degrades my ideals and places a low estimate on my freshman-year knowledge when he insinuates that I am prompted by "the simple object of having the teeth look better, or feel good" in my operations for oral sanitation and seems to presume my ignorance of "the anatomical, histological and pathological conditions," etc. While he may be perfectly correct, his acknowledged unacquaintance with me should have prevented him from making that assertion. He also insults my intelligence by inferring my incapability to comprehend the physiological benefits to be derived from oral hygiene.

In reply to the doctor's climax, in which he expresses surprise that I am not acquainted with the work of Dr. Smith, and says that unless I can quote references to show that prophylaxis was practiced years ago, I must give "honor to whom honor is due," I would say that he is again merely assuming that I know nothing of Dr. Smith's work. I would call his attention to the fact that in no place in my letter did I refer to a "Systematic and Regular Scheme of Preventive Dentistry." My only reference was to prophylaxis in its common usage—dictionary significance. If the doctor wished to use the word in a different sense, in his paper of December, he should have so defined it. I quoted Dr. Mills as claiming to have cured a large percentage, and Dr. Riggs as claiming to have cured 90 per cent of pyorrheal cases treated. Now, is a cure not a greater feat than prevention? That is, in itself? Then, did I not go further than Dr. Adair requires of me? Why should Dr. Adair assume that Dr. Riggs and Dr. Mills did not have a system by which they could control their patients and see them as often as it was necessary? Do not the quotations in my January communication indicate that they did the work as thoroughly as it is done now

or was done at any other time? Does any practitioner using the system the doctor mentions claim to do more than they claimed? Is there *any* indication in the so-called (I am borrowing a word from Dr. Black) prophylactic literature of the present that it goes any farther in the recognition of the far-reaching effect of unsanitary mouths than did Dr. Mills? If the premises suggested by these questions stand, then surely I have given "honor to whom honor is due" and rectified a miscarriage of credit. In my last paragraph I tried to give the present advocates of oral hygiene their full measure of glory. In doing so I feel that I did justice to some for the work they have done and are doing and gave more honor to others than they deserve from the profession, in view of their treatment and attitude toward those practitioners who happen to differ from them.

The doctor is probably entirely right in saying that the system, as he presents it, is carried out by very few in the United States. In the first place, we do not all possess the temperamental characteristics necessary to impress our patients with the necessity for so much attention. Again, some of us who might be able to do that are not ourselves convinced that it is at all necessary. In my own practice, pyorrheal gums have been restored to a healthy condition after three or four treatments by me the number of visits depending upon conditions and response and then the patient is faithfully co-operating with the brush by going around the gingivæ, at stated intervals, with a toothpick dipped into carbolic acid. I am not prepared to say that carbolic acid is preferable to any other of a number of medicaments that are recommended, and I have not always advised its use. Nor am I sure that any medicament is needed. The removal of that agglutinate of which Dr. Black speaks may be all that is necessary. I do, however, know that I have had good results while using the acid and am convinced that in many cases the patients can contribute about 90 per cent of the necessary treatments. I have patients carrying out Dr. Black's recommendation - using toothpick to loosen agglutinate and syringe to remove it.

I have always told my patients that cleaning the teeth is often more important than filling them; so that, so far as I am concerned, the doctor is again wrong when he says that this operation is "looked down upon."

If Dr. Adair will consult the second paragraph of my January letter he will certainly be convinced that I know what prophylaxis means and that he is misusing the word. The definitions given in my former communication do not differ from those used by present lexicographers, and I repeat that he should use his Systematic, etc., nomenclature if he wishes to define his system of oral hygiene. He must realize that the visits are no more prevention than the twisting of wires are orthodontia. Each is a factor. We can twist wires without regulating teeth, and we can have innumerable visits without a step toward prevention. The visits are usually necessary for the application of the treatments; and so, also, are the twisting of the wires usually necessary for the application of most orthodontic apparatuses.



My incentive for the January letter was to comment upon the origin and use of the words "prophylaxis and prophylactic" and to point out the fact that the present prophylactic wave is nothing more than a revival of the oral hygiene propaganda as presented by Harris, Mills and others. Because a set of men, by dogmatic, vociferous, repeated, and often insulting proselytizing, arrogate to themselves credit dependent only upon slight changes in the method of treatment is no more reason why they or any one of them should claim originality than has the man who improves upon a patent right to claim to have invented that which he has merely modified. Have they really improved upon Riggs and Mills? I have already pointed out, they claim no better results and no more far-reaching effect than did the original propagandists.

Finally, I wish to assure Dr. Adair that nothing that I have said that could be construed as offensive is intended for him. While his inferences as to my lack of knowledge of the cause he is championing are not particularly flattering, they are presented in a gentlemanly manner, and I hope that after reading this letter he will revise his estimate. I also wish to say to him that I have both heard and read articles presenting the present movement, and repeat that they have stimulated and inspired me with confidence; while articles by men like Drs. Kirk, Black, Goadby, and a number of others have furnished me with food for thought, directed my observation, taught me something of the underlying causes from the scientific standpoint and the possibilities of the profession's advancing to the point where removal of the deposit will be unnecessary by our being able to control it. That will be *scientific prophylaxis*. In order that the doctor may not consider this a day-dream, I commend for his edification and contemplation articles by these gentlemen, which he will easily find in his library, and especially a paper by Dr. Black and the discussion of the same. Dr. Black's paper appears in this month's *Dental Review*.

Philadelphia, April 9, 1912.

G. F. LOGAN.

## CARE IN PREPARING WAX MODELS FOR CAST INLAYS

By Edward H. Hickman, Arcole, Ill.

A proposition that has worried me is the polishing of cervical margins, in interproximal spaces, of gold inlays without injury to the gum tissue. The inlays cut much harder than gold foil fillings. We can burnish gold foil fillings and polish them smooth; but if we do not get the gingival margin of our wax model properly trimmed it is difficult to polish the inlay after it is set.—*Dental Review*.

If I could be made the greatest king that ever lived, with palaces and gardens and fine dinners, wines, coaches and beautiful clothes, and hundreds of servants—on consideration that I would not read books, I would not be a king. I would rather be a poor man in a garret, with plenty of books, than a king who did not love reading.—*Macaulay*.

# COMPILATIONS

## PRESIDENT'S ADDRESS.\*

By John T. Grant, D.D.S.

ON THE NIGHT of June the 17th, 1891, I graduated from the Louisville College of Dentistry, and not forgetting that frequently it is the ass of the class who is chosen for its speaker, I am free to state that it was the proudest moment of my life when it was publicly announced that "John T. Grant, D. D. S., of California, will pronounce the valedictory." And now on next Saturday night, June 17th, 1911, twenty years after to the day, almost to the hour, I shall have finished my duties and privileges as president of the State Dental Association of the most resourceful State on which the sun ever shone.

This is no idle honor and for months I have looked forward with much pleasurable anticipation to this hour, that I might express to you in some feeble way my appreciation of this honor which you have so generously given me, free from opposition and without my asking.

During the last few days I have feared that the weakness incident to my recent indisposition would deny me this privilege, but fortune smiled and I am permitted to thank you all most heartily, after twenty years in my profession, for the very highest honor possible at your hands; and you will not doubt me when I say, that for the second time in my professional life, this is my proudest moment.

In these days when everything from mushrooms to music comes in cans, if one would preserve the freshness of even an address, it is a good plan to make the final writing of that address as near as possible to the date of its delivery, but the last two weeks in which I expected to do this work I was compelled to devote to the sanitarium and the surgeon. So in case my remarks prove to be too fresh in spots, I feel sure your charity will consider that this was written as I lay in bed and may prove to be punctuated with a variety of pains and pills.

If a dental president's address cover all important points, it is likely to become liable to the same criticism which our Gaelic friend made of the dictionary: "It would be a more raidable document if the subject changed less frequently;" so with the hope of avoiding this predicament in a measure, I have left some matters to be properly handled by committee.

In 1891 I began my dental practice and my first month's receipts were twelve whole dollars. I shall not tell you on which side the bank

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\*Delivered before the Thirty-eighth Annual Session of the California State Dental Association, held at San Francisco, June 14th to 17th, 1911. Reprinted by permission from the *Pacific Dental Journal*.

balance is today, but I have an object in this statement. The second month brought me \$33, the third, \$90. In those days \$100 in my hands looked bigger than the Palace Hotel, for I had gone two years to college, paid all fees, purchased a college outfit and books, clothed myself—had my wardrobe stolen and bought another—paid my railroad fare to the east and back, paid room rent and board for two college years, attended functions, had many friends and a “bully” time (of its kind) and graduated at a total cost of \$1,063.

With others I became a member of this association in 1892. Next morning the *Examiner* caricatured my long face and hair. I cut my hair. Any information concerning the successful changing of faces will be thankfully received. Every year save one I have attended these meetings and I recall the many generous entertainments which this association has extended to even its most obscure members who came in from the woods and broke their way into membership. At times we have departed somewhat from such entertainments and the “Dutch” treats which now and then took their places have at times cost several dollars for each participant, and at those times I have noticed that more than two-thirds of our membership have quietly dropped out, and so I have asked you this year to establish a “Dollar” dinner that every new member with a \$12-a-month income may enjoy the gathering, and it is my earnest request that you perfect the “Dollar” dinner, making it a genuine social rather than a professional affair and a permanent monument to our democracy.

Activity in dental legislative circles during the last session of our state legislature gave us some expense, some trouble, some education, a little concern and quite a bit of merriment. When I met with the committee on dental legislation, before the Senate committee which was to consider the Hurd dental bill, I had not been advised that the snorting senator from the sunny south was planning to invite all comers to participate in a match game of metaphorical mouth-making, so I found myself poorly prepared to enter the ring, but it was a source of much pleasure, as certain members of our committee goaded him into the collar, to observe how he emphasized his brayings by pawing the table vigorously with his fore hoofs, and at the same time it was a bit perplexing to note the phenomenal shortness of his ears. As this senatorial hybrid uncorked his vials of wrath and his barrels of bad grammar and bull-dozing manner, he was a grotesque illustration of the truism, “whom the gods would destroy they first make mad.” In reality, the Senate never took him seriously, and his bill stood about the same chance of success as that tallow dog you have heard about that was chasing an asbestos cat through—the tropics. While I fully agree with the last plan of campaign of the legislation committee, we are also agreed that the law is far from perfect and even if the most ignorant of our opponents help to make manifest the law’s weak links, let us be large-spirited enough to amend each weak point as promptly



as it can be consistently done, at the same time preserving the best interests of the laity and the high standard of the profession.

I hope that at no distant date every state may do her share toward making possible a universal reciprocity, by a thorough renovation and reorganization of each dental school and by awaking to the real dignity which the profession demands. But so long as some State schools have no more idea of dignity than have their sock-less senators, a reciprocal recognition of credentials between states will, of course, be impossible.

While considering legislation I wish to call your attention to another point, not new, for I feel a personal resentment because of a criticism of our State Board of Dental Examiners—a criticism which has been made at times for several years, and regardless of its justice or injustice it indicates a weak point in our dental law, and one easily remedied. Almost every unsuccessful applicant for license swells the anvil chorus with the refrain, "The Board 'had it in for me.' My standing was high enough. I could prove it if they would let me see my papers." To be a member of the State Board of Dental Examiners is a thankless job, with a peon's pay, and we can silence forever this criticism and successfully obviate any disgruntled demonstration on the part of any unsuccessful candidate, by treating this matter as we did the matter of license renewal; making it no longer optional with the Board, but making it possible at a definite time for each unsuccessful applicant for license to review his papers and question or permit his chosen representative to question the examiners upon the disputed points. This would entail a greater expense but fewer applicants would request a review without belief that the chances to win were genuine; and should any future Board of Examiners entertain an unworthy member, his opportunity for unfairness would be greatly lessened; and I earnestly recommend that this change, or a similar one, be made in our dental law with all possible dispatch.

The dinner given in honor of Dr. Jenkins in Paris is a healthy indication. If we recall the names of our profession's benefactors who have gone through life unhonored and unrewarded, I fear we may find ourselves liable to the charge of having saved our garlands for their dead, cold brows and of having buried them in the potter's field.

When a brother practitioner comes forward with a worthy invention let us be glad to pay him for it and be duly generous in our praise.

These opportunities are short-lived. Each year the hand of time leads from our fellowship the strong with the weak, the young with the old; and while this year's toll in numbers has been small, it has taken from us two pioneers in our work whose helpfulness and whose hearty hand-grasps we shall sorely miss.

Dr. S. E. Knowles, president of this association in 1882, and a member ten years earlier, having a little more than passed the three-score mark, passed from earthly activity at his San Francisco residence the eleventh

day of last month, after a most useful and successful life devoted to his profession.

Dr. Hackett, who had recently been made a life member of this association, and who was particularly characterized by a genial and gentle manner, passed away at his Napa home on October 11, 1910.

Every human joy makes possible a greater joy and when Science and Philosophy are done the human heart comes back to the one universal hope suggested by these words of Ingersoll at his brother's grave: "From the voiceless lips of the unreplying dead there comes no word but in the night of death. Hope sees a star and listening love may hear the rustle of a wing."

Consciousness came to a child one day,  
 A child who was yet unborn,  
 For his heart with his mother's so touched and kissed  
 That her sweetest fancies he could not resist.  
 Thus he dreamed of a beautiful morn  
 Which grew into joys of a perfect day  
 And blended at eve into starry gray.  
 And he dreamed a dream of his mother's arms  
 And his heart heard a lullaby,  
 And he longed to be cuddled and coo'd and kiss'd,  
 While a nameless something he seemed to have missed  
 Caused his baby soul to sigh  
 That there might come true his fancies wild  
 And make him a rollicking, frolicking child.  
 "But 'tis all a dream, just a foolish dream,"  
 He said, and his heart was sad,  
 "For who ever felt a real mother-kiss?  
 Alas! there is no other world than this.  
 Now's the only time to be glad."  
 So he reveled and romped in a boisterous way,  
 Tho his sad little heart continued to say:  
 "O, would it were true—such a soulful dream  
 Of arms that would me enfold  
 In a wonderful world so wild and free,  
 Ah! vain, vain hope that there e'er could be  
 Such a world of green and gold."

\* \* \* \* \*

But Nature was true to the old, old way,  
 And the child came into the world one day.  
 \* \* \* \* \*

A fear crept into the heart one day  
 Of a man who was ill and old.  
 His steps were feeble, his sight was dim,  
 And pitying eyes were turn'd on him,  
 As he measured his wealth of gold.  
 "'Tis all as naught," he said with a sigh,  
 "For soon, too soon, I am sure to die."  
 "Ah, what if the dream of my youth were true,  
 That death were the dawn of life,  
 That instead of the toll of the funeral knell  
 'Twere the joyful clang of the rising bell,

Where mother and child and wife  
 Would laughingly cry as I op'd my eyes,  
 'Why love, you are lazy, 'tis time to rise.' ''  
 'What a beautiful, cheerful, foolish dream!—  
 None ever return to tell  
 That death is aught but a wakeless sleep,  
 Dreamless and silent and chill and deep.  
 And blacker than dungeon cell.'''

\* \* \* \* \*

But Nature persists in the same old way,  
 And the man passed on into life one day.

\* \* \* \* \*

These are prosperous times. Dental fees are good. Your patients are paying all they can afford. Many are paying more. Are you becoming well-to-do? It is my one best bet that if you are making a good living and meeting all necessary demands upon your income you feel you are fortunate, and you are hoping vaguely that something will happen to take care of you in your less active years. What is the matter? Do you pay your laboratory assistant too much? Not if his work is good. If he is like some I have employed he is a bitter luxury at any price. Surely the distributor of dental goods earns pay for the service he renders. One dollar today buys the best bur on the market. A few years ago with material and labor less than half what they are now, we paid from two to three times as much. How can the manufacturer stand the decrease? Or, what is more to the point, how many times the cost of that bur did you pay in the old days? This only shows what the manufacturer can do and yet thrive, for dental goods in general have at least held their own and in many cases increased in price. In my ignorance of processes or for other cause I have not found sufficient reason why bullion gold approximating \$16 per ounce should cost us from \$32 to \$40 per ounce when returned to us in prepared foil form. Is it not natural to wonder whether some manufacturers are getting not only the lion's share, but also a too liberal slice of the pittance which the mouse has earned?

Doubtless the manufacturer is lame and slow who has not a ready and sufficient explanation and defense of his every commercial act, but I for one am ready to be shown. Think you this is a dream? Then you are the dreamer and waking will be pain. But the sooner you are awake the better for you and for your patients. The decision last week of the United States Supreme Court in the Tobacco Trust case is an indication of health, and future developments will be watched with interest.

In re-reading what I have just read to you, I find the real reason for my conclusion that the president's address is a sort of annual pill, as I suggested to you in my letter announcing this meeting. In reality, this address of mine rather resembles a shotgun prescription, which may be explained by the fact that it was outlined within speaking distance of the surgical department of the sanitarium.



Perhaps 'twas fumes of ether mixed with dreams of deeds to come  
 Which addled eggs of promise and put my brains upon the bum.  
 At any rate, I dreamed I died. St. Peter let me in.  
 'Twas field-day in the mansions blessed for those from realms of sin.  
 And every mother's son of earth, howe'er his life he'd spent,  
 Must do some stunt in contest in just one great field event.  
 The "patience" contest caught me—it looked to be a snap.  
 For was I not a dentist and also a married chap?  
 My schooling surely was complete and so devoid of dread,  
 I butted in where older angels didn't care to tread.  
 The conditions were too many to be by me expressed,  
 But finally there was to be this grand and awful test:  
 Each participant's appendix was lifted from its place  
 And he who begged for water *last* was the chap to win the race.  
 I wept for Job, the patriarch. His moanings rent the air.  
 I was too paralyzed to speak, too damn near dead to care.  
 I should have died a second death and quickly, too, I think,  
 But Job began to beg: "Yea, Lord, I drink, good Lord, I drink!"  
 And this surprise gave back my speech, and glibly as could be  
 I said: "Well, Peter, since I win, just turn the hose on me."  
 And thus this patience contest twixt mortals in the skies  
 Was mine. A lowly dentist was awarded highest prize.  
 But it is only just, my friends, to call to your attention  
 That Job, the patriarch, was given honorable mention.  
 What was the prize? I've vainly tried for days and days to think.  
 I swapped it to the Devil for a glass of ice-cold drink.  
 Next day was resurrection day, and Peter passed this hunch:  
 "Here, 'Patience,' come and help me separate this dental bunch."  
 And when you fellows all arrived of course I let you in.  
 But there were others I held up whose faces showed their sin;  
 The man who sniffs the root canal his brother dentist filled—  
 His nose was frozen in that shape the moment he was killed;  
 The man who shrugs his shoulders when he views another's work  
 Or damns his brother with faint praise, with wink or shrug or smirk;  
 The man who blows his own brass horn right in a stranger's ear;  
 And all the rest, you know the bunch, I had them standing near.  
 And when St. Peter hove in sight, he viewed them with a frown  
 And said in scorn: "Step this way, gents, your lift is going down."  
 And up our elevator shaft was wafted from below  
 This sweet refrain by fiendish voices singing sweet and slow:  
 "Be a sneaking, scheming knocker. Down your fellow-man,  
 Jump upon his solar plexus. Kill him if you can.  
 Stand upon his quivering carcass, heels upon his eyes,  
 Kick his teeth out. Show the people how you choose to rise."  
 Down, down, and down we went, and when we halted with a jerk  
 The Devil nailed our dental friends and straightway went to work.  
 He opened up each abdomen with scalpel, cherry hot,  
 And grasping tongue and caecum, he tied a sailor's knot.  
 He clutched each by the knot he tied and dropped him in a well  
 Which was broad as all creation, and as deep as merry Hell.  
 He filled it with formaldehyde and passed this gentle hunch:  
 "Twill take about a million years to purify that bunch."  
 And as our elevator rose from out that lurid land,  
 Where sweet asbestos lilies bloom on almost every hand,

The music of a million groans sent forth by that sad gang  
Was blended with the cheering words the impish choir sang:  
"Be a sneaking, scheming knocker. Down your fellow-man,  
Jump upon his solar plexus. Kill him if you can.  
Stand upon his quivering carcass, heels upon his eyes,  
Kick his teeth out. Show the people how you choose to rise."

Life is too short and opportunities so many that no man can afford to be a "sneaking, scheming knocker." Down your fellow-man and the world will eventually down you. Stand upon his solar plexus and you will sooner or later feel the weight of the world on yours. It is a short-sighted policy for any one to say, "Oh, yes, Dr. Smithers is a good dentist if he would only do this and that," or, "Dr. Smithers is pretty good at regulating, but I could have done your work in half the time he did." The most unethical man in the profession today is he who studiously damns with faint praise another practitioner. But it is not worth our while to worry about his finish. Destiny waits for him just around the corner.

In this connection I feel impelled to state that no matter what errors or indiscretions may be justly chargeable to the past professional life of a brother practitioner, I believe that the profession generally and the public at large can not be injured by our willingness to forget his past and give him every opportunity in our power, and to encourage him to an honorable, upright and useful future just so soon as he demonstrates his willingness to make a change in his career for the better.

The fact that a code of ethics is necessary is a sad commentary upon our intellectual and moral stature. While we pride ourselves that our code of ethics is a statement of our virtues, it is in reality only an acknowledgment of our weaknesses, a guiding path cut deep in the soil that the intellectually weak and the morally blind may not go astray, for he who is strong of spirit and right at heart may go in safety, without path, cross-country to the goal.

What would be our mental attitude toward an individual who, applying for citizenship, should insist first in reading our criminal laws that he might know just how far he might go and yet escape the penitentiary? Criminal law was never made for the strong and straight. Dear, old, stern necessity (mother of invention) loved our criminal law into life that the weak and wicked might not go astray. In like manner he who demands to read our code of professional ethics before uniting with the association, is inclined to be either naughty or "nutty," and for his own sake and ours he should be under constant surveillance until it is evident that he has grown greatly in both grace and gumption.

The innate cussedness of protoplasm has never been conclusively demonstrated, and it may be that all unethical action originates in ignorance rather than ignominy, in which case our attitude toward an erring brother should be always charitable, encouraging him to do the fair thing whether he is inclined to do it or not, keeping always in mind that there is no place in life for condemnation since none of us are so very good.

The old verse which we knew when children which began: "Dare to do right, dare to be true," voices the only perfect ethical spirit. Let us not outgrow it. Let us not become artificially superior to and disdainful of its teachings. An elaborate statement of a complicated system of ethics will never perfect our conduct. What we need is to cultivate the kind of open mind and genuine life which will destroy in us any *desire* to wink or shrug or sneer or raise the brows when inspecting or discussing the work of another. Confucius, Buddha, Mohammed, the only Prophet of Allah, and the Lowly Nazarene have all stated the same simple test of ethical conduct, "As you would that others should do unto you." This is ethics safe and sane. If we make this spirit our spirit, all rules of ethics will sound in our ears like the rattle of dry bones.

Let us be great enough to recognize merit wherever found. There is room in this world for everybody and particularly is this true of this broad land in which we live. None can prophesy the wondrous strides we may make in the next few years. Ever since the more sturdy and independent of our forbears dared the dangers of the pathless deep that they might throw off a real or fancied religious tyranny, every new paroxysm of civilization has headed westward the more sturdy and self-reliant of their children until children of pioneers, grandchildren of pioneers, and pioneers again: the most sturdy offspring of the most self-reliant parentage have come together and have loved into being the spirit which rebuilt this incomparable city in a night.

The most alert, the most vital, the most courageous, the most indomitable and aggressive and yet the warmest and most sympathetic; yea, the *best* blood of all the progressive and aggressive peoples of the earth flows in the pulse beat of this Pacific slope.

"Oh, land that lines the fretting, western sea,  
Thy years of plenty are but just begun;  
The thousand peoples that will flock to thee,  
To seek their Mecca at the setting sun,  
Will make thy fair hills fairer yet, and sow  
Thy mountain-sides, where now the tall pine waves,  
With yellow corn; the olive tree will grow  
Above the mounds that mark the Indians' graves;  
From broad, great plains, where countless cattle roam,  
The church-spire pointing to thy azure skies,  
(About it many a happy, peaceful home)  
A monument of progress will arise,  
And blest by Heaven—by Nature doubly blest—  
The world shall find its Eden in the West."

Nature has given to men one tongue, but two ears, that we may hear from others twice as much as we speak.

—*Epictetus*.



# SOCIETY ANNOUNCEMENTS

## The Georgia State Society

The forty-fourth annual meeting of the Georgia State Dental Society will be held at Americus, Ga., June 11, 12 and 13, 1912. Instructive papers have been secured and the clinic committee will unquestionably present a fine list of clinics.

A cordial invitation is extended to all ethical dentists.

M. M. FORBES, *Secretary*, 810-811 Candler Bldg., Atlanta, Ga.

The section of Bibliography and Documentation of the "Fédération Dentaire Internationale" (F.D.I) has established headquarters at 3 bis, rue de la Régence, Brussels, Belgium (Palais des Beaux-Arts), and contributions of books, newspapers, pamphlets, catalogues, engravings and photographs relative to the dental art are solicited. All such should be sent to the above address.

## Wisconsin State Dental Society

The Wisconsin State Dental Society will hold its forty-second annual meeting at Oshkosh, Wis., July 9, 10 and 11.

O. G. KRAUSE, *Secretary*.

## Chart Wanted

Metropolitan papers refer to the examination of the teeth of school children and speak of its efficacy. Twenty-six years ago Dr. C. M. Wilcox not only advocated the same thing, but put it into actual effect in New Paris, Ohio, examining free of charge the teeth of every child in the schools and giving each child a chart showing the condition of its teeth. About ninety per cent of the children had teeth that needed attention for their preservation and for good health. Dr. Wilcox would like to have one of those old charts and takes this means of asking if any person has one of them. He is willing to pay a small reward for one of them.

## OFFICIAL APPOINTMENT

April 10, 1912.

### GREETINGS:

*To the Officers and Members of the Third Australian Dental Congress.*

Know ye, that the National Dental Association of the United States of America hereby appoints the bearer, Dr. C. N. Johnson, of Chicago, Ill., a delegate from this Association, with all the rights and privileges thereto appertaining, to attend the Third Australian Dental Congress, to be held at Brisbane, Australia, July 8th to 12th, 1912; and it wishes to convey to you, through him, our fraternal greetings and best wishes for a most profitable and enjoyable meeting.

Witness our hands and the Seal of the Association this 10th day of April, 1912.

[SEAL]

(Signed) ARTHUR R. MELENDY, *President*.

HOMER C. BROWN, *Rec. Sec.*

## North Carolina Dental Society

Park Ave. and Madison St., Baltimore, Md.

The thirty-eighth annual meeting of the North Carolina Dental Society will be held at Raleigh, N. C., in hall of the House of Representatives in the Capitol, July 3-4-5-6, 1912. Instructive papers have been secured and the clinic committee will unquestionably present a fine list of clinics. A cordial invitation is extended to all ethical dentists. Thanking you in advance, I remain yours truly,

J. W. STANLY, *Secretary*.

## The Arkansas State

The next meeting of the Arkansas State Dental Association will be held in Little Rock, at Marion Hotel, June 19, 20 and 21. Every effort will be made to make it more interesting, more instructive and more entertaining than ever before. Each individual, by his support, can materially assist in this desirable result.

We are calling the meeting after the closing of the colleges in our nearby states, and I feel confident that we may expect the presence of some of their prominent men.

IRVIN M. STERNBERG, D.D.S., *Secretary*.

Fort Smith, Ark.

### The Clinic of the National Dental Association

The clinic committee desires to extend to all members in good standing of all dental societies a cordial invitation to attend and to clinic at the "all day" clinic of this association, to be held at the New Willard Hotel, Washington, D. C., Friday, Sept. 13. The enormous ball room, top floor of this hotel, has been secured, and the management promises us every convenience.

We wish particularly to call your attention to the classification of the different clinical material, where every effort will be made to arrange the different events according to title and in sequence so that the various steps in the operation may be seen at a glance without the usual regard to chair or table. This will avoid confusion and save time, allowing the members to select and study favorite subjects without hunting all over the room. From the material now in hand, your committee can promise a large and varied clinic, that we may assemble all clinicians' names and titles for the preliminary program. Kindly reply at once to

CLARENCE J. GRIEVES, *Chairman Clinic Committee,*

### The Indiana State.

The fifty-fourth annual meeting of the Indiana State Dental Association was held at Claypool Hotel, Indianapolis, May 21, 22, 23, 1912, with the largest attendance in the history of the society.

The literary program was unusually interesting, the clinics well prepared, and nothing occurred to mar a most successful meeting.

All papers and discussions, as well as description of principal clinics, will be printed in THE DENTAL SUMMARY, the official magazine of the Society.

New officers were chosen as follows:

President, H. M. Thompson, Indianapolis; vice president, W. E. Kennedy, Indianapolis; secretary, Otto U. King, Huntington; treasurer, F. M. Sparks, Rushville. Executive committee: W. R. Meaker, Peru; supervisor of clinics, A. R. Rietz, Evansville. Trustees: J. W. Stage, Goshen; L. E. Varsndol, Washington; Edward Grace, Logansport; H. C. Carr, Indianapolis.

### STATE BOARD MEETINGS

#### Pennsylvania

The next regular examination of the Pennsylvania State Board of Dental Examiners will be held in Philadelphia and Pittsburgh on Wednesday, Thursday, Friday and Saturday, June 19, 20, 21 and 22, 1912, the practical work being held on Wednesday. Application blanks can be secured from the Department of Public Instruction, Harrisburg.

ALEXANDER H. REYNOLDS, *Secretary,*

4630 Chester Ave., Philadelphia.

#### North Dakota

The next regular meeting of the North Dakota State Board of Dental Examiners will be held at Fargo, commencing Tuesday, July 9th, at 9 A. M., continuing through the 11th. For application blanks and full particulars address

F. A. BRICKER, *Secretary,* Fargo, No. Dak.

#### Montana

The Montana State Board of Dental Examiners will meet in Helena July 8, 9, 10 and 11 for the regular annual session. All desiring to take the examination will please send in their application to the secretary thirty days prior to July 8th.

G. A. CHEVIGNY, *Secretary,* 106-8 Clark Blk., Butte, Mont.

#### Idaho

The next meeting, for examination, of the Idaho State Dental Board will be held in Boise, Idaho, beginning July 1, 1912, at 9 A. M., at the Capitol Building.

ALBERT A. JESSUP, D.D.S., *Secretary.*

#### South Dakota

The South Dakota State Board of Dental Examiners will hold its next meeting at Sioux Falls, S. D., July 9, 1912, at 1:30 P. M., continuing three days. All applications for examination, together with a fee of twenty-five dollars, must be in the hands of the secretary by July 1st. Applicants who have not complied with the above will not be permitted to take the examination. For further information, blanks, etc., address

ARIS L. REVELL, *Secretary, Lead, S. D.*

**Wyoming**

The Wyoming State Board of Examiners will meet to hold an examination for the examining of applicants at the State Capitol, Cheyenne, Wyo., on the first, second and third days of July, 1912. All applications must be complete and in the hands of the secretary fifteen days prior to the time set by the board for examination to begin.

The written examination consists of Anatomy, Physiology, Histology and Bacteriology, Chemistry and Metallurgy, Oral Surgery, Anesthetics, Operative and Prosthetic Dentistry, Materia Medica and Therapeutics, Prophylactics and Orthodontia.

For further information and application blanks, address

PETER APPEL, JR., *Secretary*, P. O. Box 643, Cheyenne, Wyo.

**North Carolina**

The next regular meeting of the North Carolina State Board of Dental Examiners will be held in Raleigh, N. C., July 1st, 1912. For further necessary information address the secretary, DR. F. L. HUNT, Asheville, N. C.

**Wisconsin**

The Wisconsin State Board of Dental Examiners will convene in Milwaukee, at Marquette University, on Monday, June 24, 1912, at 9 A. M., for examination of applicants to practice in Milwaukee. High school diploma, applications and \$25 fee must be filed with secretary fifteen days prior to above date. Dental diplomas to be filed in advance of examination.

F. A. TATE, *President*.

W. T. HARDY, *Secretary*,

422 Jefferson St., Milwaukee, Wis.

**American Society of Orthodontists**

The twelfth annual meeting of the American Society of Orthodontists will be held in Chicago, Ill., Monday, Tuesday and Wednesday, July 1, 2 and 3, 1912.

FREDERICK C. KEMPLE, *Secretary*,

576 Fifth Ave., New York City.

**Oregon**

Dentists desiring to make special preparation for the Oregon State Board in June, write Dr. T. W. Sharpe, Dekum Bldg., Portland, Ore.

**Michigan**

The next regular meeting of the Michigan State Board of Dental Examiners will be held at the Dental College, Ann Arbor, commencing Monday, June 17, at 8 A. M., and continuing through the 22nd. For application blanks and full particulars address

F. E. SHARP, *Secretary*, Port Huron, Mich.

**Arkansas**

The next meeting of the State Board of Dental Examiners will be held in Little Rock, Ark., June 17th and 18th. All applicants are required to pass an examination to obtain a certificate. Examination fee \$15.

E. H. JOHNSON, *Sec'y and Treas.*,

Citizen's Bank Bldg., Pine Bluff, Ark.

**Kansas**

The State Board of Dental Examiners will meet at the National Hotel, Topeka, Kansas, June 17, 1912, beginning at 7:30 p. m., for the purpose of examining applicants to practice in Kansas, and transacting such other business as may come before the board. All who want a license to practice in Kansas should be present, as there will be no mid-winter examination in 1912. The board will furnish chairs, lathe, vulcanizer and patients. The applicant should bring an engine, smaller instruments, and the material necessary for clinical work. The applicant will be permitted to charge a small fee to cover cost of material. The examination, both theoretical and practical, will aim to cover the subjects gone over in college.

The examination fee is \$25. This, with the application, should be in the hands of the secretary at least five days before the meeting of the board. For application blanks and any other information, write the secretary.

O. H. SIMPSON, *President*, Dodge City, Kans.

G. F. AMBROSE, *Secretary*, El Dorado, Kans.



# NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

## ATTENTION

### Members of the Dental Profession of the United States of America

The Fifteenth International Congress on Hygiene and Demography is to be held in Washington, D. C., September 23-28, 1912, under the auspices of the United States Government.

This is the most important meeting of this kind held in this country in its history; and the United States Government is acting as host to the fifteen nations that have so far signified their intention of participating in the coming Congress.

This organization is the highest authority in matters of Hygiene in existence today.

Through the courtesy of the United States Government, the dental profession of this country has received an invitation to contribute to the success of the coming Congress. A place has been made for representatives of the dental profession both upon the literary program and among the exhibitors. This is the first time that the dental profession of this country has received such recognition by the home government.

The opportunity for which we have been seeking, that is, the opportunity to show the important relation the human mouth bears to the health, strength and welfare of mankind, is now before us.

The influence of this Congress is world wide in its scope and will be visited by thousands upon thousands of people who are interested in Hygiene and the general welfare of mankind.

If American dentistry is to maintain its reputation throughout the world it behooves the members of the profession of this country to unite in a general effort to have the largest, finest and most instructive dental exhibit in the history of dentistry assembled on this occasion.

At the request of the Oral Hygiene Committee of the National Dental Association, Dr. J. W. Schereschewsky, U.S.P.H. and M.H.S., director of the exhibition, has set aside 1,000 square feet of floor and 500 square feet of wall space in the building, which is being erected for the exhibits, to be devoted for the use of

the dental profession for exhibit purposes.

At the meeting of the Oral Hygiene Committee of the National Dental Association, held in Cleveland, March 23, 1912, a resolution was passed inviting the Oral Hygiene Committees of all state and local organizations to co-operate with it in making a success of this exhibit. Space will be assigned in such a manner that each state, city and town will receive full credit for contributions in this direction.

The committee earnestly requests that every member of the profession, who is interested in Mouth Hygiene and the welfare of the dental profession, become actively interested in a campaign to make a success of this exhibit. The Oral Hygiene Committee of the State Dental Societies should endeavor to place themselves in touch with local organizations in their states in an endeavor to secure aid in the way of material suitable for exhibits and in money to defray the expenses of such an exhibit as this should be. The committee would ask that each state and local organization make appropriations to meet the expense of collecting, mounting and displaying such material as would make a creditable exhibit.

The committee requests that the Oral Hygiene Committees that can or will take part in this exhibit communicate at once, or at the earliest possible moment, with Dr. W. G. Ebersole, chairman of the Oral Hygiene Committee of the National Dental Association, 800 Schofield Building, Cleveland, O., or, for local information, to Dr. W. Smith Frankland, The Burlington, Washington, D. C., assistant secretary-treasurer of the National Mouth Hygiene Association for the District of Columbia.

The Oral Hygiene Committee of the National Dental Association instructed its secretary, Dr. Waldo E. Boardman of Boston, Mass., to communicate with Dr. William H. Porter of Boston, Mass., with a view of obtaining some idea of the dental exhibit which was shown at the International Hygiene exhibition in Dresden,

# THE DENTAL SUMMARY

The Magazine That Helps

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JULY, 1912

No. 7

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The Ohio State Dental Society  
The Michigan State Dental Society  
The Indiana State Dental Society  
The Kentucky State Dental Society  
The Louisiana State Dental Society  
The West Virginia State Dental Society

The Northern Ohio Dental Society  
The Northern Indiana Dental Association  
The Eastern Indiana Dental Society  
The Southwestern Michigan Dental Society  
Odontological Society of Western Pennsylvania  
The Lake Erie Dental Society

and Several Local Dental Societies

Editorial Office: 1255 Neil Avenue, Columbus, Ohio  
L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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## DENTAL DIAGNOSIS.\*

By Don M. Graham, M. D., D.D.S., Detroit, Mich.

IN ALL DEPARTMENTS of dental surgery there is nothing more important than an early and accurate diagnosis, that unnecessary tissue changes may be prevented and that remedies may be intelligently applied for the amelioration of the pathologic condition. The importance of this branch is recognized, in general medicine, to the extent that a specialty embracing it is now practiced. In dentistry there is a much narrower field for its employment, to be sure, yet the necessity for keen observation, close inquiry and fine discrimination is quite as needful if we are to do intelligently preventive or even successful repair work.

It is true that, in a great many cases, a diagnosis of dental or periodontal lesions is comparatively easy. In the vast majority of cases the

\*Read before the Michigan Seventh District Dental Society, December, 1911.

symptoms, subjective and objective, will be sufficient in themselves to enable us to arrive at a correct diagnosis. There are cases, however, in which a diagnosis is not so easily made and in which irreparable damage may follow a wrong or a delayed diagnosis.

It will be unprofitable for us to enumerate and discuss the many approved and universal diagnostic methods in vogue in dental practice, such as percussion, inspection, etc., and if we are fortunate enough to have our patients pay us frequent visits, a careful, systematic inspection for caries and inflammation of the soft tissues will effectually prevent many per-

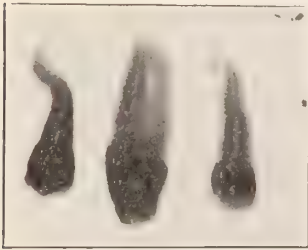


Fig. 1



Fig. 2

Fig. 1. Shows one reason for imperfect root canal fillings.

Fig. 2. Perforation of root, protrusion of canal filling and apical abscess as result.

plexing pathologic conditions and obviate the necessity of a diagnosis. Even with these patients, however, we may be greatly puzzled at times on account of certain abnormalities, such as pulp stones, secondary dentine, etc., nor should we forget that trauma plays an important part in the death of many pulps. When a patient presents herself, suffering from



Fig. 3



Fig. 4

Fig. 3. Perfectly filled root canal of central with lateral apical abscess, the result of imperfect root filling.

Fig. 4. Central and lateral canals imperfectly filled, with consequent apical abscesses.

some dental pain, the history will usually aid us. Too much reliance, however, should not be placed on patients' statements, as we have all learned, for not infrequently we have encountered obscure and indefinite nerve utterances whose origin was remote from the suspected region.

The mention of simple and almost universal diagnostic methods would appear superfluous and unpardonable were it not a fact that much unnecessary suffering is endured in any community for the reason that many



dentists fail to seriously and intelligently seek the pathologic lesion which is responsible for this outcry of the nerves. When a cavity can not be located by the metallic searcher, too often the patient is dismissed with the assurance that she is suffering from a neuralgia (?) which, nine times out of ten, is entirely amenable to dental treatment if a correct diagnosis were made. Thermal stimulation is, perhaps, the most universal of these agencies as well as the most convenient, but its application demands some care and thoughtful attention to details. Hot and cold water can be applied to the suspected tooth until we get responses which will help us to an intelligent interpretation and location of the pain. That there may be no

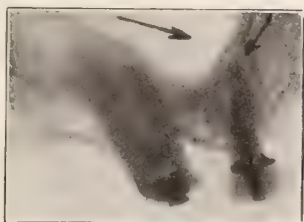


Fig. 5



Fig. 6

Fig. 5. Near perforation of bicuspid, with imperfect root filling.  
Fig. 6. Abscess from uncleaned root canal.

mistake from this method, it is often advisable to isolate the teeth by means of strips of rubber dam, when the offending tooth may be more certainly apprehended. A hot spatula can also be used, and much information can be gained from the appearance of the tooth, while transillumination by means of a small electric bulb will aid us very materially in differentiating



Figs. 7 and 8 illustrate the value of radiography in locating unerupted teeth in the adult jaw.

between vital and devitalized teeth. The most reliable diagnostic agent in this latter connection is undoubtedly the galvanic current. Five to twenty milliamperes from a small storage battery, a switchboard, or even an old cataphoric outfit, can be depended upon to differentiate between vital and devitalized teeth. We must always take the precaution of properly insulating the suspected tooth before we can be justified in arriving at a con-

clusion from this procedure. The rubber dam for this purpose is indispensable where teeth have metallic fillings.

As much of our work is done on concealed structures, it is obvious that the true condition of these operations can not be ascertained by any of the above-named methods. The true condition of our root canals and adjacent structures can be revealed only by radiography. In the dental apparatus we have varying degrees of density, and for this reason there is no part of the human anatomy which permits itself to be so successfully radiographed for diagnostic purposes. Since the advent of radiography there is little excuse for experimentation in these cases as an imperfectly filled canal, an extruding root filling, a resorbed or perforated root, an unerupted tooth or retained root, together with the condition of the surrounding area, can be



Fig. 9



Fig. 10

Fig. 9. Small retained molar root which was the cause of the disfigurement shown in No. 10.



Fig. 11



Fig. 12

Fig. 11. A necrotic area unsuccessfully treated until the true cause was revealed, by the radiograph, in the distal inclination of unfilled bicuspid root.

Fig. 12. Large apical abscess which demanded amputation of root before repair took place.

quite distinctly outlined on a good skiagraph. In fact, in no department of the healing art is there so little excuse for treating empirically as in the treatment of alveo-dental lesions.

As the laity, as well as the medical profession, are "almost persuaded" that neuralgias about the head and face are generally of dental origin, the patience and ingenuity of the conscientious dental practitioner will often be taxed to the limit in diagnosing many of these obscure and indefinite aches and pains. Dormant abscesses, unerupted and impacted teeth, as well as retained roots, are not infrequently the cause, and in these and

many other cases the information gleaned from a good radiograph is most reliable and conclusive. In general surgery a keen diagnostic insight is most valuable to the successful surgeon, although it is said the combination is rarely found in actual practice. So in radiography, a wide and intimate acquaintance with dental pathologic conditions is almost an essential to successful diagnoses by radiography. The grosser lesions, it is true, require little training to interpret, but in many cases irreparable damage has followed an incorrect interpretation of a skiagraph. Indeed, the limitations of radiography should be recognized quite as readily as its possibilities.

On account of superimpositions, the root-canals of upper first bicuspids and upper molars, as well as mesial roots of lower molars, are always difficult of successful radiographing, so that an intelligent and accurate interpretation of skiagraphs of these regions can not be made as ordinarily rayed. It is safe to say, however, that the careful student of dental anatomy and pathology will encounter few cases in which safe and accurate diagnosis can not be made of the many pathologic conditions of concealed dental and peridental structures, such as perforations, root fillings, necroses, unerupted and impacted teeth, as well as many other concealed conditions requiring diagnosis. The proof of these statements we shall leave to the lantern slides, the consideration of which we shall find more interesting and profitable than the mere enumeration of pathologic conditions which are amenable to radiographic diagnosis.

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## THE SELECTION AND PREPARATION OF ABUTMENTS FOR BRIDGE WORK\*

By J. Melville Thompson, D.D.S., Detroit, Mich.

WHEN a bridge engineer is called upon to throw a span across a river or chasm, his first task is to take soundings, secure samples of dirt, rock, etc., also make borings to find, if possible, solid rock upon which to place the foundations which are to support the piers or abutments which, in time, carry the whole structure. It requires a man of scientific training to estimate properly the stress and strain which the elements will bring to bear upon it, aside from the weight which the traffic passing over it will call upon it to carry.

While it is not my purpose to belittle, in any way, our efforts in bridge-building, I will (in saying that we have all sinned and come short of the glorious heights to which we aspire) share with all the censure which could rightly be placed upon some of our efforts.

Those of us who have read Dr. Chayc's articles in the *Items of Interest* remember the pictures of bridgework which had been made by men whose reputation for good work was beyond question. Too many bridges are

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\*Read before the Michigan First District Dental Society, 1911.



placed in mouths because the one doing the work sees a chance for so many dummies at 6, 8 or 10 per, and the work is done, the bridge driven to place, and the patient sent out with two or three otherwise comfortable roots feeling sore and bruised, with the assurance that they will soon adjust themselves and feel all right. The result is, however, that in a year or two one end of the bridge and the tooth upon which it was placed is moving up and down in a nice, juicy pocket, with the process and peridental membrane all gone, and the next fellow takes a fall out of the adjoining tooth, and maybe he does as well as No. 1, and maybe he does worse.

In the selection of abutments for bridges in the mouth, three important considerations present themselves, viz: length of span, permanency of individual abutment, and appearance of bridge when finished. The idealist talks of restoring, through orthodontic means, teeth which have, through the loss of their neighbors, moved out of position, have lost their normal occlusion and have developed deep pus pockets upon the surface nearest the space toward which they are inclined, as in drawing No. 1.

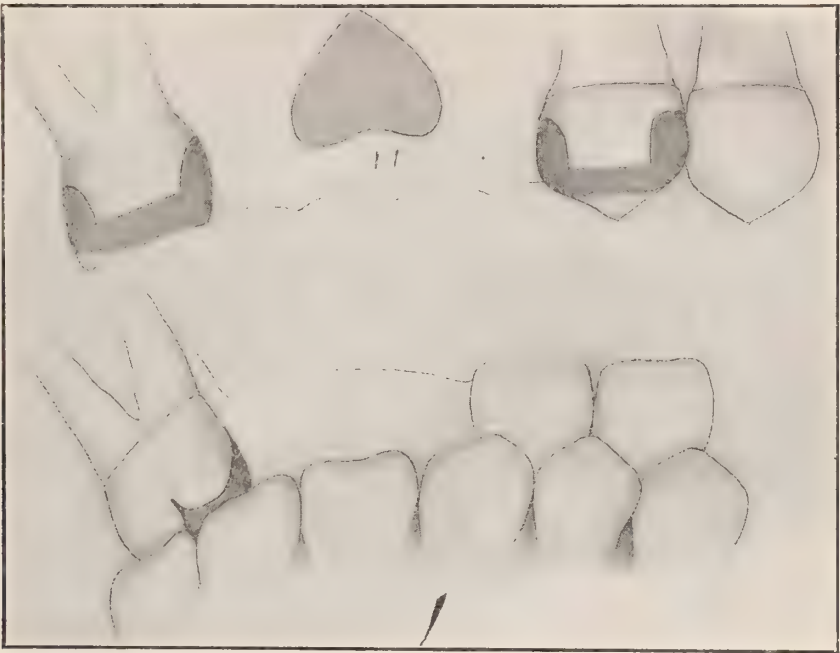
In a paper written by Dr. Endelman, of Philadelphia, four or five years ago, entitled "The Uric Acid Problem as Related to the Pericemental Inflammations," many interesting facts are brought out regarding malocclusion as a cause of pyorrhea alveolaris. There is no question about malocclusion being one of the most prolific causes of inflammation and pus pockets about the teeth. Time and space prevent discussion of this particular phase of the work, nevertheless it is highly important. I should like to hear a paper by some one more fully equipped to bring the subject forth than the writer.

A study of tables showing relativity of decay shows that the first molar is most frequently lost, and through the loss of this highly important member many evils follow which bring problems for us to solve.

The question of the use of teeth with vital pulps has been solved in part by the use of the cast gold inlay. This, like other good things, has been much abused, and time is showing that good judgment must be used in selecting places for such attachments. Compound cavities in vital molars and bicuspsids are the most favorable places to use inlay attachments, and while some claim much for inlays in devitalized teeth, their application should be made in a manner which will not call upon weak buccal and lingual walls to stand the lateral strain which a bridge necessarily brings upon them. Teeth which have cavities filled near the gum line (as in drawing No. 2, ABC) should be excluded from uses of this kind, as, sooner or later, they will cause trouble. In spite of the fact that the average banded root is an abomination, the fact still remains that a carefully prepared and banded root is the most stable support which can be made for a bridge. The arguments for and against bands are apparent in Fig. 1.

Referring to Drawing 2, an illustration of an acceptable banded crown for a molar may be made by the use of inlay platinum formed in a cone shape, after the familiar method of Dr. E. B. Spalding's cone for jacket

crown. This may be carefully fitted over the root and burnished over a pin set in the root canals, or any form of abutment which is found advisable to use. If a shell crown is preferred to the solid cast crown, the band is easily adapted over the platinum, but not crowded down too far. By waxing both platinum and gold together and investing, 22k solder is readily flowed between the band and the platinum cap, which may be again fitted to the root and the impression taken and a two-piece crown made in the usual way. This gives a beautifully adapted crown with the possibility of a minimum amount of gold at the deep cervical margin.

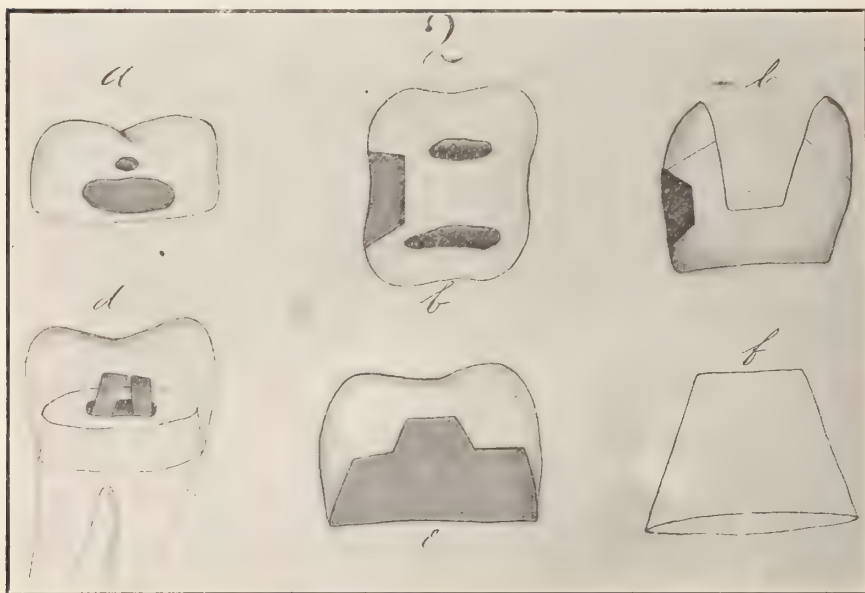


Referring to Drawing 3, it shows how the lingual surface of a cuspid may be left projecting above the gum, thus affording ample attachment for a band without necessarily wounding the gum in any way, and the original form of the tooth is easily restored through the casting process.

When it is found necessary to place a crown, which is to support a bridge, upon a devitalized tooth, much care should be used in inspecting the root of the tooth and marking the possible lines of cleavage, which show up many times when the hot blast of air is used in drying them during the preparation. Many times the writer has observed, as probably others have also, that little white chalky lines extending from the opening of the pulp canal toward the outer surface of the root, are plainly visible (Fig. b, drawing No. 3), which mark the cleavage of the root sooner or later if too much stress is put upon it through loosening of the crown or from the use of gutta-percha as a retainer for posts, or from a crown that is poorly

occluded and too much stress brought about in this way. When such conditions are found to be present a banded crown is indicated in preference to all others.

In our work, as well as in other lines of mechanical work, it is necessary to conserve every bit of strength of the foundations upon which we work; consequently it can be easily seen in looking at Drawing No. 36, that a crown supporting a bridge, placed on a cuspid or bicuspid root without a band, is supported simply by the thickness of the tooth, from the circumference of the root canal out. In the case of single porcelain crowns this is a different proposition. Even then the root should be prepared in such a way that the crown acts as a binder. In these days of cast bases and the



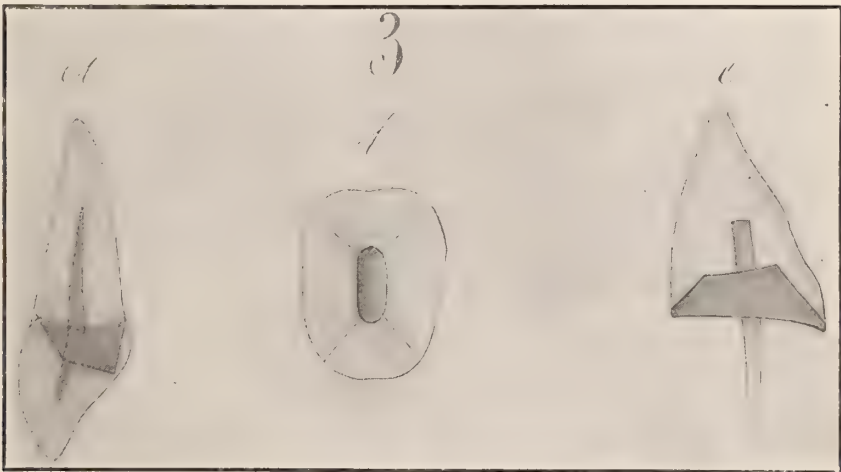
use of inlay foil, or in some cases the Tatem mesh, beautiful results can be produced without irritating masses of gold being left near the gum line or impinging upon the cementum in any way.

Since the advent of the cast gold crown and cast bridge my method for making individual crowns has been changed materially. Some of them are a little bit "fussy," I might admit, but the end justifies the trouble which I have caused myself. In the first place, the post is anchored firmly in the root (Drawing 2d), believing in this way a better union between the root and the post is established. Over this post and the end of the root is formed a tube and cap which is burnished to place and covered with inlay wax and cast. Many times the whole crown can be made in one casting, removing the facings and placing pencil points in the holes, according to the usual procedure. In this way we can make a band that is thick enough, where it is necessary, and thin enough to be non-irritating, between the



teeth, and beautifully adapted as well. Another advantage in placing the post in the root and forming the crown over this is, that in divergent or convergent roots the part extending over the root may be made parallel with the other post, so that there is no drawing or difficulty in placing the completed work in the mouth. Referring to the heart-shaped drawing, No. 11 in drawing No. 1, we have represented a cross section of a sanitary bridge which is far superior to the ordinary flat under-surface. This is shaped in a manner that brings the apex directly over the ridge of the lower jaw and presents a smooth surface that is easily cleansed. Facings have no place in lower bridges back of the bicuspid.

In closing this paper, which is necessarily brief and incomplete, owing to the short time allowed for its reading and also for its preparation, a few "don'ts" will not be out of place:



Don't place bridges upon abutments that have not been first made, through prophylactic measures, as healthy as it is possible to make them.

Don't place gold shell crowns upon vital teeth unless thoroughly conversant with methods for removing enough of the enamel to straighten the sides.

Do not use unnecessary facings upon bridges used for masticatory purposes only.

Do not cement a bridge to place which draws or causes the teeth to feel uncomfortable upon which they are placed, because it is less trouble to saw it apart and place the parts in position and re-solder than it is to lose a good patient and a couple of good teeth.

Do not forget that the writer has been "through the mill" and knows whereof he speaks.

## SOME SPECIAL FEATURES IN BRIDGE WORK\*

By Dr. A. L. LeGro, D.D.S., Detroit, Mich.

I WILL DESCRIBE a case of absorption cavity, of which Dr. Noyes, of Chicago, tells me there have been only three reported in the dental profession. I mention this to explain my position in making this bridge the way I did.

A patient came to me with a lower right first bicuspid aching. I explored around the gum line and found no sign of a cavity whatever and really was at a loss to know how to treat the tooth, but finally, after it had gone along and I had bluffed the patient three or four days, he came in with the tooth loose or broken and said it acted just like a loose baby tooth. I suggested that he go over to Dr. Hickey and have an X-ray taken of it. He said he was quite sure there was something wrong, because the tooth was loose in the socket. He went over and found that the tooth was broken and had what was finally determined to be an absorption cavity midway down the lingual side of root. I had never heard of it, nor could I find anything about it in any dental literature. In extracting this case I found that the absorption cavity had gone down in the lingual side of the root and there had been no irritation whatever. Evidently the odontoclasts had overcome the odontoblasts, and it had absorbed out clear under the gums, leaving the gingival border of the gums in perfect condition. This absorption had gone on so far that it had encroached upon the pulp chamber, and when it was extracted you could see the pulp in the center surrounded by a thin layer of dentine. We came to the conclusion that the healthy circulation in the pulp had prevented the odontoclasts from working on that small, thin line of bone around the pulp. We extracted this tooth, and soon after he developed a toothache in the right lower cuspid which tipped lingually, and an absorption cavity was found in this tooth also. The man had a perfect set of teeth otherwise and there were no cavities in his mouth aside from this absorption cavity, and I hesitated for a long time as to just what to do, but finally came to the conclusion that copper amalgam used here where the dentine had been absorbed out and the contour restored with copper amalgam, was indicated. So gutta percha was packed in and the patient wore it for a couple of days and had a lovely time, too, but the tissue which formed in the cavity and was very healthy, in fact as healthy as any of the tissue in the mouth, was forced out and the cavity filled with copper amalgam, at the same time devitalizing by going in on the lingual side of the crown. This gave us a foundation to work on and some attachment had to be decided upon, the patient objecting to gold. We decided to put in a bridge filling in the space vacated by the second bicuspid, the bridge extending from an inlay abutment in the first molar

\*Read before the Michigan First District Dental Society, 1911.

to the attachment in the lingual side of the lower right cuspid. A Carmichael abutment was made with a pin attachment for the anterior abutment, and the bridge completed. In about six months the anterior abutment loosened owing to the fact that the lower cuspid tipped lingually. The bridge was re-cemented and loosened again within a month, showing that the mechanical principle of the lingual abutment on a lower cuspid which tipped into the mouth was wrong. The molar inlay abutment remained secure, and as it seemed a difficult matter to remove it, a rather ingenious scheme was hit upon to hold the anterior abutment firm. A small hole was drilled through the labial enamel plate of the lower cuspid just above the cervical margin through the tooth and the Carmichael abutment on the lingual side. A counter-sink was made on the labial surface of the tooth and on the lingual side of the abutment. Iridio-platinum wire was used as a post through the labial-lingual diameter where the tooth had been drilled. The post was threaded, Bryant screws were used on this post. The space between the root abutment and the tooth proper was thoroughly cleansed with alcohol and then a fine cement, by means of a cement syringe, was forced through this hole and around the attachment. The Bryant screw was attached to one end of the post, the post put through the soft cement, another Bryant screw screwed into the counter-sink on the labial side of the tooth. This was polished down, leaving a small circular gold filling showing on the labial side of the tooth which was not objectionable to the patient. This attachment was tightened in this way about three years ago, and is still doing excellent service. That is the only unusual case of bridge work that I can recall in my practice.

I want to say a few words in regard to inlay attachments. I employ what I call detached posts in inlay abutment and will briefly describe the technic of making these abutments with detached posts. If the tooth is not already devitalized, steps are taken immediately to that end. The cavity is prepared with the idea of as strong retention as possible, consistent with the usual conservation of strength in the walls. A wax inlay matrix is procured as usual. The wax inlay is removed. A square iridio-platinum post is procured and slightly tapered from one end to the other. This post is fitted perfectly in the root decided upon for retention. The post is removed and a platinum matrix box is made around the square post, by wrapping platinum matrix material of ribbon-like form around the post. This is soldered with pure gold, which completes a square box, tapering, which fits perfectly the square post. This box shall be made preferably a little greater in length than the diameter of the wax model through which the pin is to pass. The box is placed back on the pin, which has been previously oiled, the wax inlay form is placed in the cavity, the post and box heated, and gently passed through the wax form into the root. Now, next, a very warm pair of pliers are used to grasp the post and a sharp instrument is placed on the edge of the box around the post to hold the box firm in wax while the warm pliers are used to remove the



post after loosening it from the box, leaving the box imbedded in its exact relative position in the wax inlay. The wax inlay is cast and the little platinum box forms a correct hole through which the post passes and into which the post fits accurately. When the bridge is completed and ready for insertion the bridge is cemented, and while the cement is still soft the post is forced to place through the little square box. Excess of post is removed and burnished down, leaving no signs except in color of the work that has been done to the inlay. This I consider the solution of inlay abutments in bridge work. The same principle may be applied where roots converge or diverge, resulting in a keying of the end of the bridge by the post when inserted.

In regard to abutments being used in lower molars which are tipped forward, I think it advisable in all cases where patients are under thirty years of age to either send the patient to an orthodontist, or to yourself push the molar back into normal occlusion. The object of this is that the pocket which invariably forms to a certain extent on the anterior root of a tipped molar will entirely disappear if the tooth is in normal occlusion. If the tooth is left out of normal occlusion and the roots left in their original tipped position, any correction in the crown itself, so far as occlusion is concerned, will not benefit this pocket, which almost invariably forms on the anterior root of a tipped tooth. But in cases of long standing, and where the age of the patient will not permit new bone tissue to form, I think it advisable to use either the inlay abutment with detached post or fill up the tooth that has been entirely divested of its crown with a shoulder abutment of cast metal, and then put on a cast gold jacket crown. The cast gold jacket crown seems very easy to make if you have not tried it, but I made twenty-five before I hit upon the solution of the matter. To take an impression and make a cast model of a shoulder jacket gold crown over a lower tipped molar is an impossibility, because we have not arrived at that stage in casting where we can get the investing material to compensate for the change in the gold during crystallization. I, therefore, originated a scheme which with me has met with eminent success. After a tooth is prepared with a metal abutment, a shoulder and gold band is fitted around the metal abutment resting on the shoulder all around. This gold band must fit loosely. The length of the bite must be measured, the band cut off and a top soldered over, making a plain box of gold. The next step is to take this box of gold and slit the border all around at the gingival point of contact. This is done in order to retain the wax that is afterwards used in getting the impression of the shoulder. Now the box is taken and gently dipped into melted inlay wax, removed and allowed to cool, and then dipped again several times consecutively until a natural rope of wax is formed on the periphery of this gold. Now a sharp knife is used to remove the wax on the inside of the band, leaving a half round of wax with which you are to procure the impression. The wax is then heated gently until it is of the consistency usually used in preparing wax models.

and gently pressed down on the shoulder of the tooth, and with the aid of flat instrument the impression of the shoulder is perfectly taken. Now the melted wax is painted on the rest of the tooth with a camel's hair brush, until the correct contour and articulation is procured. The crown is invested and cast. The fact that a loose band has been used allows this crown to slide over the abutment perfectly, and almost in every instance a perfect shoulder fit is made. Now, I do not think it was possible for any man to make a gold shell crown that will be of equal service to a tooth as an abutment. A tipped crown always has some irritation about it and the lap of the gold is a source of constant irritation and unsanitary conditions as long as it remains on the tooth.

## DISCUSSION OF PAPERS BY DRS. THOMPSON AND LE GRO

DR. WARD, Ann Arbor: Mr. President, I have not very much to say; in fact, I got to visiting and forgot what you have been talking about for the last few minutes. There is one thing that was said tonight that impressed me very favorably, and that was said by Dr. Thompson at the close of his discussion, that was, that the inlay was in its infancy as far as an attachment for bridgework was concerned. Since I went back to Ann Arbor, about three years ago, I have had an opportunity to see now the third year, some of our inlays that had been put on under conditions that I have a record of. The first year we had nearly four hundred; the second year five hundred and fifty, and last year between six and seven hundred. I kept a book and kept all the details, I have overseen all the work, and most of them were nearly as good as I could do them myself. This showed up in the third year: that the inlay in devitalized teeth will not stand long. The tooth structure seems to go way beyond the inlay. In three years it shows that it is not standing up well. There are some reasons for that. They have got their cement, of course, strongly acid, and they are making their powder decidedly hard, and are getting an immense adhesiveness and an immense solubility. Whether it is the acid in the cement before the devitalized teeth, but this much does show up, the devitalized teeth do not hold an inlay like live ones. I believe an inlay in a devitalized tooth as an attachment for bridgework is very nearly a temporary piece of work. I believe that inlays, except in young patients, are overdone a great deal. There are a few cases come to us. I think in the last year five or six cases came from the orthodontist with the first molar to be supplied, and one or two cases the second bicuspid to be supplied. What will you do with the cases fourteen to eighteen years? It is very evident that something ought to be done that would retain it. In that case the compound inlay with post in the occlusal surface, to retain it in there only on one end of the bridge, seems to be about the only thing to do. A compound inlay could be made in a molar, pin set in it, twenty or twenty two gauge posts, and this inlay would hold one dummy, providing it had support on the anterior end, and the anterior inlay, with a slot in it, might hold that end of it. In no case would I attempt to put two inlays on the same bridge. I cannot get inlays to suit me half the time when they are alone. They do not suit me when they are not attached to anything. If you put a couple of inlays in a bridge, it is going to have sloppy joints and a temporary piece of work will be done, and I feel that the Chicago boys are overdoing many times the inlay problem in bridgework. They are crazy about it, and almost all of them are doing it. I can see that the inlay has a great field. It is good in many places, but I have not much use for it in bridgework unless I am figuring that it is a case of four or five years. I have very little use for it in devitalized teeth.

I had an experience that I can report that corroborates Dr. Oakman's talk. I went to the meeting of the Southwestern Dental Society and had an abscessed tooth and was

caught away from home with it, and it had been progressing eight or ten hours, and when I got in I was glad to have anybody get hold and take it out. The next morning I went to Dr. Hall, and Dr. Wilson made a 10 per cent solution, and made it fresh, and they packed that tooth, and in five minutes' time, before they got to work, I had my feet and fingers tingling and my hands paralyzed. I could not use my hands at all with the pack in that pocket. It would not work on me to use very much cocain in 10 per cent solution, and I should be very much afraid to allow a patient to pack it in the nose. I have very favorably used the cast base mount in place of the gold inlay, but I don't mean in the sense that you bake it on the root and expect to get a casting. I have almost invariably taken pure gold and swaged to it. I have done that with my backings for my facings. I have done it in places where I wanted an edge of that sort, molars, bicuspid, or anything else. If I wanted cast bases, I swaged it or burned it with pure gold first. If I had any crown, almost any crown, you may say, and wanted a cast base I would not expect to cast wax through it and get it just the way I wanted it, nor a backing. In the molar I nearly always take an impressison, as Dr. Spalding is doing, and many others, and make the base on a die, and on that build up my tooth. I sometimes use part gold and part porcelain, with the overlapping margin of pure gold. I can file that off and get a base that is pretty good. It is in reality a band crown, but it is not a band crown that fits over the root, but the tooth. I slip it over cement. I think most of us are getting away from the old-fashioned shell crown, although I think many of us are coming to the root preparation, but it takes time to prepare the root.

DR. MACDONALD: About what per cent of those devitalized teeth have shown deterioration?

DR. WARD: We have a great variety of conditions: Some of those teeth have been devitalized a long time and some have been recently devitalized. Comparing those which have been recently devitalized by the boys, and the inlay put in right away—there is nothing like the change in those which have been devitalized some time before—only those which have been devitalized some years before that we get hold of are a poor proposition.

If I had that case and there were any sized cavity in it, and it had been devitalized four or five years, I would make a cast crown. I think in some cases it would do, but, as a rule, I do not care very much for the inlay to carry two or three teeth. For one tooth supporting a bicuspid, it would do, but I don't believe I would use it for anything but a young patient, to carry two or three teeth.

DR. MACDONALD: There are so many cases of bridgework to supply, using a cuspid as an anterior abutment, and the cuspid is possibly the hardest tooth to reproduce in the mouth, and it is very desirable to retain that cuspid if possible. Under all circumstances, then, if you devitalize that cuspid yourself you would use an inlay for the anterior abutment.

DR. WARD: If it were not too long. If it went to the second or third molar I would not do it. People talk inlays, but when it comes to deliver the goods on a bridge that is a fine piece of work, they cannot do it. We have cases where the inlay will carry one or two teeth that is free at one end, as I spoke of, where you have an inlay in a molar and a support in the other end. When you come to attach something to the other end it is a different problem and you don't get a fit. I think a swaged crown over the outside of the two teeth will give more service than one on the inside, spreading the walls out. There is an enamel disintegration that takes place. A number of times those edges look first rate, and a number of them we have burnished and re-burnished, and still they come back to us and the enamel is gone.

DR. THOMPSON: I want to say one thing before I go. I mentioned a banded crown. I did not mean the ordinary gold shell crown. I presume there are no men here that put on fewer gold shell crowns than I do. If I do have to put on a gold shell crown I look the other way.



## SOME IMPORTANT POINTS IN CONSTRUCTING ARTIFICIAL DENTURES.\*

By C. H. Woolgar, M.D., D.D.S., Clyde, Ohio.

FROM time prehistorical man has been trying to restore lost dental organs. As now constructed, artificial dentures are designed partially to restore the appearance of the face, and partially the lost functions of mastication and articulation. We must grant that this is one of the dentist's major operations.

The lower jaw forms, with the temporal bone, the tempora-maxillary

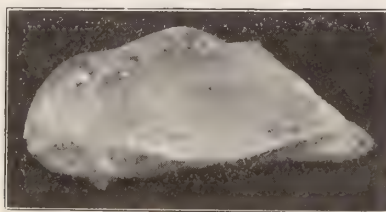


Fig. 1

joint, the condyles of the mandible articulate with the glenoid fossa (which is a concavity in the temporal bone).

The inferior jaw has a hinge-like motion, a gliding motion, and a rotary motion; the inferior maxillary bone has as much free movement as any bone in the body. The normal denture is so arranged when in apposi-

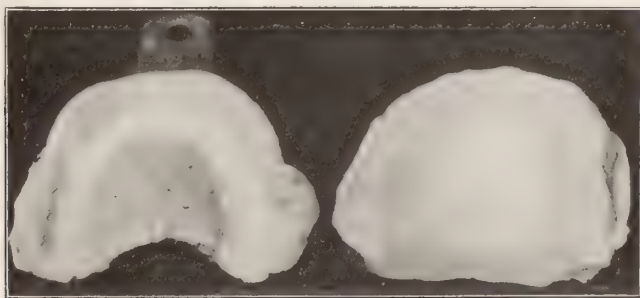


Fig. 2

tion that there are always at least three separate places of contact between the upper and lower teeth in any position the lower jaw may be placed.

The hinge-like motion of the jaw is the only motion usually taken into consideration when constructing artificial dentures, the so-called occlusion motion. To construct correct dentures involves the understanding of the movements of the jaw, and the anatomical peculiarities of the jaws that are to wear the artificial teeth.

\*Given as a clinic at Ohio State Dental Society, 1911.

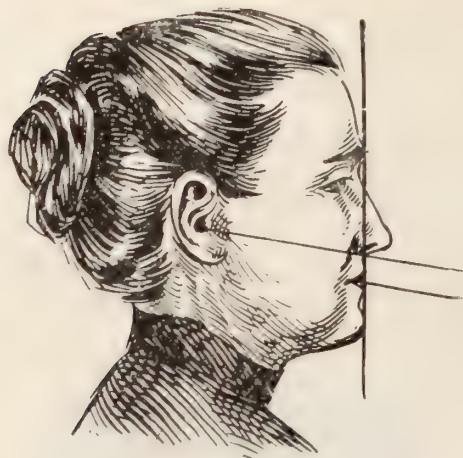


Fig. 3

The first step is taking the impression. Select an impression tray very little larger than the jaw, and one not deep enough to exert any force on the buccal-dental or dental-lingual mucous membrane when placed on the jaw; if it does, the impression received will be larger than the jaw. The mucus should be washed from the upper jaw previous to taking the impression; for this purpose there is nothing better than two or three drops of cresol in a glass of water.



Fig. 4

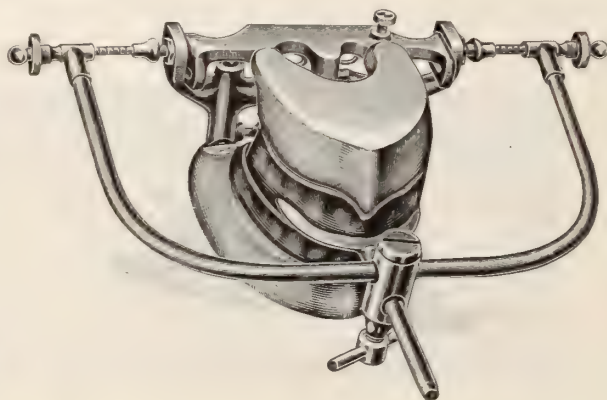


Fig. 5

Jaws very hard to fit may be successfully fitted by first procuring model of jaw. Construct an impression tray that fits tightly to the model, warm the tray and some modeling compound, spread thin layer of compound over warm tray and press tray firmly against jaw, remove from mouth and trim off excess of compound, warm and reinsert. Repeat this operation until impression requires some force to remove from the jaw. Fig. No. 1 is one of these specially constructed trays.

For taking ordinary impression use a combination of modeling compound and plaster Paris. Fill the tray with warm modeling compound and press over the jaw, remove impression from the mouth while still partially



Fig. 6

warm, and with thumb and fingers increase size of impression, and chill modeling compound in cold water. Mix some impression plaster and put about a spoonful into impression, reintroduce into mouth, force impression firmly against jaw and hold until plaster hardens; remove stain and pour plaster into impression for models. This produces a model with very

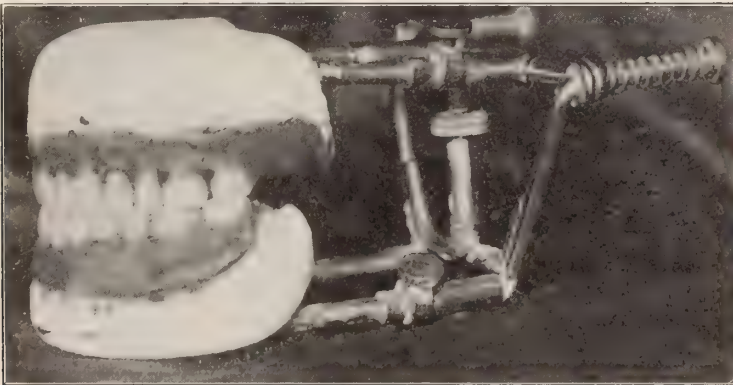


Fig. 7

smooth surface and one superior to one secured from plaster or modeling compound alone. The soft tissues have been pressed against the bone, and the plate, constructed on a model so secured, has even pressure on the jaw. Fig. No. 2 shows an impression and a model.

After securing model it should be covered with tin foil if rubber plates are to be constructed. Tin produces a dense surface on the rubber, as



proven by Dr. N. S. Essig, and prevents the formation of calcium sulphate at the time of vulcanizing, as often occurs with silex and silex compounds. The calcium sulphate is not easily removed and is a lodgment place for bacteria and invariably causes inflammation of the mucous membrane of



Fig. 8

the mouth, too often met with, and, in the present light of hygiene, is malpractice.

The usual steps are now taken toward fitting the trial plates into the mouth. Occlusal surfaces of trial plates are to be flat, parallel with a line from the root of the nose to the external auditory meatus. (Fig. 3, line "A" "B.") The usual steps of taking the "bite" are now concluded.

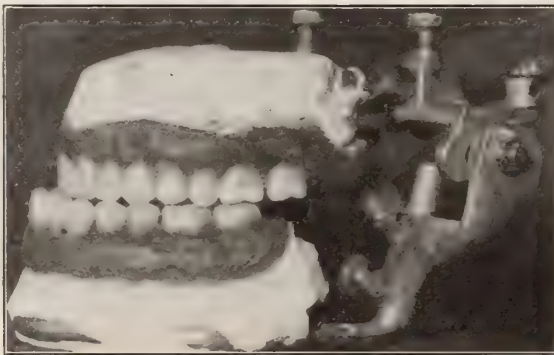


Fig. 9

We are now ready to get the measurements of the inclination of the condyle path; this operation is best accomplished by Dr. Snow's "Bite Gauge," Fig. No. 4, which contains claws on one side and cones on the other. These bite gauges are warmed enough to melt wax, and pressed,

claws side downward, into extreme ends of occlusal surface of lower trial plate, so the body of gauge is level with surface of trial plate.

The trial plates are now placed in the mouth and jaws closed at normal occlusion, the wax trial plates meet along the occlusal surface, at the same



Fig. 10

time the cone of the bite gauge is forced into upper trial plate. The jaws are opened and lower jaw protruded, bringing trial plates together, so they meet anteriorly, but not posteriorly, the gauge cones partially penetrate the wax and register the amount of protrusion of lower jaw, a line from

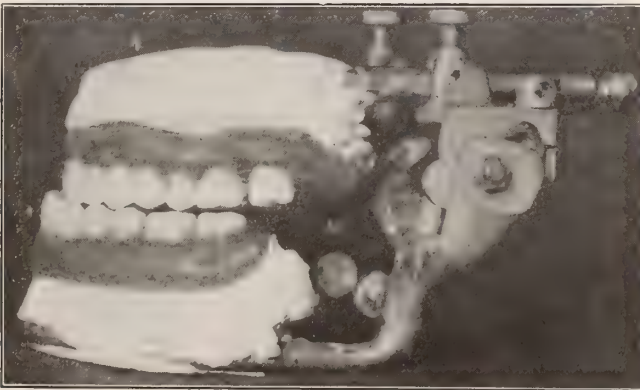


Fig. 11

the height of impression of one cone to the impression of the other cone in the upper trial plate is the same angle as condyle path. This is made use of later.

The models with trial plates are now to be attached to the articulator. To do this with correctness a face-bow must be used. Dr. Bonwill's rule of equilateral triangle of the jaw, measuring four inches in all directions,

is misleading, as Dr. M. H. Cryer's research work in measuring skulls proves. One skull that I measured was  $3\frac{3}{8}$  inches intercondyle and one  $4\frac{1}{2}$  inches intercondyle. The face-bow by which the models are correctly located on the articulator has a mouthpiece attached to it by a clamp. The



Fig. 12A

mouthpiece is warmed enough to melt wax and is forced into the upper trial plate, so as to be in the median line and parallel with the occlusal surface.

The position of the condyles should be marked upon the cheeks of the patient with a soft crayon pencil. Lead pencils are not suitable for



Fig. 12B

this work and small pieces of paper stuck on the cheeks are too easily brushed off by the face-bow. To locate the condyles is not an easy operation, especially in the aged, in whom the condyle path is nearly parallel with zygoma arch, thus partially preventing the location of the condyle, or in patients of considerable adipose tissue, muscle or parotid gland.

The jaw is opened and closed, carried from side to side with one hand, while the finger of the other hand is engaged in locating the condyle; the



condyle is *about* one-half inch in front of the external auditory meatus and about the same distance in front of tragua of the ear. The pointers of the face-bow are now adjusted so they will easily pass over the cheeks of the patient, and their ends must be equal distance from the ends of the bow. This is readily done by counting the marks on the pointers. When correct, the pointers are fastened by the jamb nuts.

The trial plates are reintroduced into mouth; normal occlusion can be ascertain by noticing if cones of bite-gauge re-enter former places in upper trial plates.

The stem of mouthpiece is passed through clamp on face-bow, pointers placed over marks on cheeks and the bow clamp is *firmly* tightened. The face-bow, with trial plates, are removed from patient and face-bow attached to articulator (Snow's, Fig. 5) by loosening clamps on pointers and extending the pointers and refastening clamps.

The bow is sprung over spurs on articulator joint. Models should be mounted so bows of articulator are parallel; this is important with any design of articulator, and especially when dispensing with face-bow. The occlusal surfaces of artificial denture are apt to be good, if constructed upon models that are mounted too near or too far from hinge of articulator,

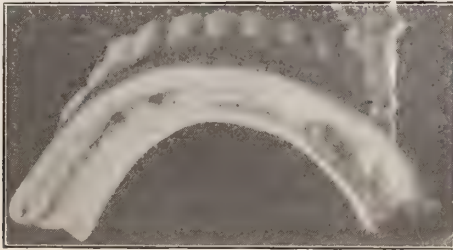


Fig. 13

to correspond to length of patient's jaw, as is shown by Figs. 6 and 7, although their usefulness is impaired and the three points of contact are lost.

In dentures made on models mounted too near articulator joint, the leverage is greater on anterior teeth, and on the posterior teeth, if mounted too far from the articulator joint, providing angle of condyle paths is correct. The Snow articulator is nicely constructed for keeping bows parallel when mounting models. (Fig. 8.)

In mounting models the upper one should be fastened first to articulator; this permits of adjusting the lower bow parallel with the upper. When models are fastened to articulator bows, jamb screws holding same should be firmly tightened, as they have a tendency to work loose.

It now remains to adjust sliding joints of the articulator to the angle of condyle paths. The trial plates are on the models, the lower one containing the bite gauges. The sliding joints are loosened; also the articulator spring, the trial plates are easily made to assume normal occlusion,

contact being at all points of occlusion; lower trial plate is brought forward and cones re-enter anterior impression in superior trial plate, the trial plates coming together anteriorly the same as they did in patient's mouth, the condyle paths on articulator assuming same angle as that of patient's condyle paths. The screws of articulator condyle paths are now tightened.

If the trial plates assume the same relation in the above two tests as they did in the patient's mouth, the measurement of length of inferior maxillary is correct, very little can be gained later by trying wax dentures in patient's mouth; this I have verified repeatedly. If "trial measurement bite" does not test out correctly, measurements of length of maxillary should be taken over, as plates made with faulty measurements mean faulty articulating dentures. It is desirable to get condyle paths same angle as that of patient: if doubt exists, secure angle of less degree. Fig. 9 shows



Fig. 14A

teeth mounted, angle of condyle path 30 degrees. Fig. 10, condyle paths of same articulation shifted to angle of 0 degrees, articulation quite good. Fig. 11, condyle path of same articulation shifted to 50 degrees, articulation very poor. This accounts for good articulation that sometimes is secured with Bonwill and Gritman articulators.

The articulator is now properly adjusted, the face-bow and bite gauges are laid aside. The teeth are arranged on the models following the law of position given us by Drs. Bonwill and Molyneaux. In setting up the teeth, the upper anterior teeth, including the bicuspid, should be arranged first (gum section teeth excluded from use), then the second lower bicuspid on each side. They should be arranged so that when the lower plate is brought forward, or side ways, the lower teeth are in contact with the upper. The first lower bicuspid is added so contact with upper teeth is secured when teeth move forward or to either side. One by one the anterior teeth are added one at a time on each side, always securing proper articulation before adding another tooth, when the bicuspids, cuspids and incisors properly articulate, the molars are added.

See that the first lower molar articulates properly with upper bicuspid, then add first lower molar on opposite side, then upper first molar, al-

ways adding lower molar before its mate above. It takes time, but results well pay for the time spent. Teeth as they now come to us from some factories are well adapted for anatomical articulation.

The practice of some to cut deep grooves mesially distally across the occlusal surface of molars makes it much easier and quicker to articulate for three points of contact, but the usefulness of dentures so constructed is impaired, causing a tendency of the upper plate to dislodge the lower.

The compensative curve of the plates is governed by the angle of condyle paths. Fig. 12A, skull has condyle planes of 45 degrees; if the circle of the compensating curve was produced would pass in front of the external auditory meatus. The circle of the compensative curve in Fig. 12B would fall across the external auditory meatus. The greater the angle of condyle paths the greater is compensatory curve.

After wax plates are constructed, flaked and rubber packed, sometimes the anatomical arrangement of teeth is destroyed by not securing



Fig. 14B

correct readaptation of the two halves of the flask. For this reason, springs for closing flask which are uncertain in their action should be discarded.

The occlusal surface of a finished anatomical denture cannot be changed without impairing its usefulness.

What is secured for the patient for this extra amount of work? He gains much; the tipping and dislodgment of the plates are reduced to the minimum. Many patients who are unable to wear ordinary plates can wear anatomically constructed plates, speak correctly, and masticate their food thoroughly, thus adding enjoyable years to their lives; this makes the dentist a practitioner of prophylactic medicine.

Fig. 13 is one of the above named difficult dentures; Fig. 14, same denture in mouth, patient experiences no difficulty in either speaking or chewing.

What advantages are gained by the dentist for this extra work?

The dentist is able to arrange teeth upon wax plate to conform to peculiarities of patient's original teeth; to construct plates according to anatomical dental laws, that require no change when transferred to patient's mouth.



**PORCELAIN INLAY REINFORCED WITH GOLD\***

By Frank W. Sage, D.D.S., Cincinnati, O.

In incisors or canines, where a porcelain inlay coming to occlusal edge might be broken, I have in a few cases performed successfully this operation of reinforcing with a gold tip, which furthermore helps hold the inlay in place.

The inlay is inserted as ordinarily; then the end, being ground away somewhat, a gold filling is carried along the end of the tooth and malleted across the end of the inlay, serving as a buffer. This prevents the inlay breaking, and if due care be observed to so grind the end of the inlay as to have the mass of gold toward the lingual surface, very little gold will show. The inlay, it will be seen, is cemented in place before the operation with gold is begun.

This operation requires, of course, a degree of thickness of the end of the tooth to allow of grooving for the gold. The gold must be very carefully anchored, since the operation has no dependence for retention, on the porcelain. If the porcelain be beveled slightly so as to allow of the gold's exercising a retaining influence on it, so much the better.

It would seem hazardous to mallet gold upon an inlay, but I have found it unnecessary to use more than ordinary care.

The same operation may be employed, I presume, with the silicate cement filling. I have not tried it, but the five or six cases in which I have operated, as described, with porcelain, are, after from two to four years, apparently doing well.

The filling of gold may be replaced with a gold inlay, which, however, requires to be well anchored. I prefer filling after the usual way, as affording better opportunity to anchor firmly.

\*Prepared for clinic at Ohio State Dental Society, 1911.

**IDEAL BRIDGE ATTACHMENT FOR UPPER CUSPID.\***

By G. F. Burke, Detroit, Mich.

The securing of an accurate cast inlay to be used for an abutment for a bridge can best be done by reinforcing the wax pattern with gold mesh. Gold mesh, used as a framework and not as a matrix, controls both the shrinkage and warpage in the wax patterns in a vast majority of cases, and is a very distinct aid in making cast bases for crowns and in compound inlays for the bicuspid or molar teeth. In bridgework it greatly facilitates the arrangement of the dummies, enabling you to carry the wax just where you want it, and lending strength to shallow wax patterns. In the casting of removable bases it has been found a very great aid. In making bicuspid and molar crowns with cast cusps it makes a splendid substance to use, on which to place the wax pattern, and in the mould apparently fuses perfectly with molten gold.

\*Clinic at Southwestern Michigan Dental Society, 1911.

## THE SECTIONAL BRIDGE\*

By W. F. Wilson, D.D.S., Columbus, Ohio

We have occasion some times to place a bridge in which the abutment teeth either converge or diverge from a parallel position in the vertical plane; and the following is a method which will admit of such a bridge being placed without excessive grinding of abutments. The abutment crowns are made as desired; an impression taken and models made and articulated, holding the crowns in position; though having been previously filled with wax to facilitate their removal from a model. A piece of 32- or 34-gauge plate, one-sixteenth inch in width, is then doubled, making two thicknesses of plate and bent around a pointed instrument, forming a truncated cone, and the ends bent back until they extend on either side of the body. After cutting the plate at the point at which the bend was made in doubling it, the two pieces may be separated and the smaller is placed with the end which presents the smallest diameter toward the occlusal plane and waxed to either of the abutment crowns. The one which has the greatest angle of convergence being preferred, and having the axis of the cone parallel with the line in which the other crown must move in being seated upon the tooth. The lug is then attached to crown with wax and invested and either cast or soldered to the crown as may be preferred, the larger cone is then placed over the one which is attached to the crown and the facings and cusps placed in position and facings, cusps, larger cone and abutment attached together with wax, the bridge is then removed and the crown, which has the attachment made, removed from it; the remainder of the bridge is invested and cast or soldered, as desired, and finished.

In placing the bridge the crown carrying the smaller cone is placed in position first and later the part carrying the larger cone, which fits neatly over the part already in position, and the parts cemented together. The greatest force of mastication applied on this bridge will not tend to loosen this joint, but will tend to drive it into a closer and more solid union.

This is only one of many ways in which a joint of this kind may be utilized in bridgework, as the ways in which it may be used are limited only by the operator's skill and ingenuity.

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\*Clinic given at Ohio State Dental Society, 1911.

**I**F ONE door should be shut God will open another; if the peas do not yield well the beans may; if one hen leaves her eggs another will bring out all her brood. There's a bright side to all things, and a good God everywhere. Somewhere or other in the worst flood of trouble there is always a dry spot for Contentment to get its foot on, and, if there were not, it would learn to swim.

—C. H. Spurgeon.

## THE RELATION OF MEDICINE AND DENTISTRY\*

By Russell W. Bunting, D.D.Sc., Ann Arbor, Mich.

**M**EDICINE AND DENTISTRY each had its origin in very humble beginnings. Medicine, the oldest of all professions, began in the use of herbs and roots by the ancients, and was associated with witchcraft and sorcery. The earliest authentic writings upon the subject are those of Hippocrates in 500 B. C., and those of Aristotle somewhat later. From these sources we see that even as early as this a great deal of thought had been given to the various disorders of the body and a very crude therapeutics formulated for their alleviation. As in the case of all sciences, it does not appear that much progress was made in that of medicine during the Dark Ages, those of her followers who had attained some degree of knowledge being looked upon as sorcerers were persecuted as such.

Up to the eighteenth century and the time of the early settlement of America little was known of anatomy and physiology, and therapeutics were limited to physic and blood-letting, but in the last two centuries great progress has been made. Scientific research and clinical observations have built up the fund of medical knowledge step by step until medicine stands today a leader among the professions. The story of this progress is one of heroic struggles, investigation and experimentation, often carried on in the face of strenuous opposition from the very public in whose interest the investigations were made. In the earlier colonial days autopsies and dissections of the human body were discountenanced and forbidden, thus preventing the possibility of obtaining much valuable information. It was against great opposition that the advocates of Jenner's vaccine first introduced its use in this country; indeed, opposition to inoculation against smallpox has not entirely disappeared to this day, in spite of the fact that its efficiency has been so clearly demonstrated.

Until 1844 to 1850 the time of discovery of anesthesia, progress in medicine was almost entirely confined to therapeutics, surgery being very limited in its scope. Indeed, the important work in surgery dates back but thirty years, to the time when a method for isolation and identification of bacteria was discovered and demonstrated in the Koch laboratory in Berlin. By this technic modern antiseptic surgery was placed upon a scientific basis. Thus medicine, perhaps the oldest of all professions, is in reality very modern, her greatest progress having been made in recent years.

The early history of dentistry is even more vague and uncertain than that of medicine. Tooth disorders seem to have been prevalent among all races and peoples. The early literature contains an abundance of references to pain in the teeth, and certain herbs were recommended for its

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\*Read before the Michigan State Dental Society, 1911.



alleviation. We find that Hippocrates and Aristotle described rather fully some of the dental disorders, and the latter makes the statement that only those teeth which are loose enough to admit of their extraction with lead forceps should be removed. Herodotus describes the existence in Egypt, about the year 500 B. C., of a specialization of the medical profession, in that there were physicians for the head, others for the teeth, and others for internal disorders, each applying himself to one disease and no more. And yet we consider specialization a modern achievement.

In the past few years records have been brought to light of dental operations which were performed by the Egyptians and Etruscans at a very early date. These operations consisted in the filling of cavities in the teeth with tin, gold and ivory. Ivory and gold teeth, which were fastened in the mouth to replace lost members, have also been found. It is therefore quite certain that dental operations were attempted and performed with some degree of success several centuries before the Christian era.

As in medicine, whatever dental art may have been acquired by the ancients, was lost sight of in the centuries that followed. Dentists existed as early as the seventeenth century, but their work was chiefly that of extraction of the teeth and administration of nostrums to relieve dental pains. Teeth were also extracted by the physicians and barbers, who used various forms of pincers and turnkeys. Little progress was made until the time of the early colonization of this country, when the manufacture of artificial dentures was attempted and minor operations of a reparative nature were made upon the teeth. Little by little various men mastered certain operative procedures and attained to some degree of skill, but dentistry, like medicine, did not make definite progress until the last century. It was in 1851 that the use of dental vulcanite was discovered and came into general use for artificial dentures, and in 1864 the rubber dam was invented, that agent which has made possible so large a part of our modern dental operations. In 1881, just one year after the Koch discoveries, Dr. W. D. Miller, that great dental scientist, isolated the bacterium of caries and demonstrated its relation to the process of decay of the teeth.

It thus appears that the active growth of dentistry has been synchronous with that of medicine. Throughout their development there has been a mutual interdependence which has unified their interests and has caused them to become known as sister professions. Perhaps one of the earliest and most striking examples of and inter-relation between the two professions was that of the discovery of anesthesia. It was a dentist, Horace Wells by name, who first demonstrated the use of nitrous oxide, the first general anesthetic. And then it was but a few years later that Dr. Morton, a dentist, Dr. Warren, a surgeon, and Dr. Jackson, a chemist, experimented with and standardized the use of ether as a general anesthetic. Much discussion has been raised as to who first discovered general anesthesia, several claiming precedence, but it is very certain, in any event,

that members of both professions worked together investigating the properties of the anesthesia and standardizing its use.

From clinical observations and scientific data acquired, it became very evident to dental observers that the disorders with which they had to deal in the mouth were related in a very vital way to the conditions of general metabolism. And conversely, that many general disorders were related to and often originated by unhygienic or abnormal conditions of the mouth. Scientific developments of the past few years have brought out very emphatically the force and importance of this relation between mouth and general disorders. So that the need of co-operation of the medical and dental practitioner in the treatment of a large number of pathological conditions is felt more keenly than ever before. A prominent physician has said: "I believe that if dentists were better doctors they would be better dentists, and if doctors were better dentists they would be better doctors."

It might be well to consider at this time some of the pathological conditions which lie in the border lands of both medicine and dentistry, which therefore claim the attention of both professions. We will first consider those general disorders of the body which involve or manifest their effects in the mouth. The first of these which should be mentioned is that of the influence of general metabolism upon the development of the teeth and jaws. Any infectious fever or other general disease occurring in early childhood may produce periodic arrests in the full formation of the teeth, resulting in hypoplastic areas in the enamel and dentin corresponding in position to the time of life at which the disease occurred. Any continued debility, resulting from deficient nutrition, rickets, hereditary syphilis or anemia may produce a more extensive hypoplasia manifested by teeth which are devoid of enamel, teeth which are small in size or by a complete absence of certain teeth.

It is unfortunate that hypoplastic areas in the teeth, unlike other body tissues, are never rebuilt or strengthened after formation, but each arrest in development remains as a permanent defect. So that a child who suffers from general malnutrition at the time his teeth are forming, although he may later rebuild all other tissues to normal, will retain his teeth throughout life as they are first formed, be they good or bad. It is, therefore, of greatest importance to the teeth that the nutrition and general health of the child be maintained.

In later life any systemic debility will have the effect of lowering the tone of the tissues of the mouth, so that they are more susceptible to infections and will heal more slowly. The magnitude and importance of the effect which the systemic changes have upon the mouth has been too little appreciated by both the dental and medical professions. Scientific observers have very recently begun to consider some of these relations, and in the light of their findings it is very possible that we shall soon consider the mouth as a valuable diagnostic factor in the treatment of general diseases. The tongue has long been looked upon as a criterion of the circula-



1 C. H. Harroun, 1880  
 2 A. F. Emminger, 1881  
 3 J. W. Syder, 1882

4 D. A. Berty, 1883  
 5 C. H. James, 1884  
 6 F. H. Schwinkle, 1885  
 7 H. H. Harrison, 1886

8 J. E. Robinson, 1887  
 9 C. M. Right, 1888  
 10 W. H. Sedgwick, 1889

Part of an exhibit by Dr. Chas. W. Mills, Chillicothe, Ohio, at Ohio State Dental Society,  
 December, 1911—To be continued





tion and general metabolism, and is made use of by every practitioner of medicine. It is also a well-known fact that overdoses of mercury produce swellings of the gum margins about the teeth, and physicians make use of this fact to regulate their administration of calomel and other mercurial preparations. It is now recognized that not only mercury but any insoluble material floating in the blood resultant either from faulty metabolism or introduced into the body from without, may be caught in this region and give rise to an inflammatory condition of the gums. It is stated that all infective fevers and many other general diseases are accompanied by inflammations of the free margins of the gums, and that the character of such inflammation is specific for each disease, so much so that a trained observer might often diagnose a general disease by the condition of the gums alone. For instance, cases have been reported in which dentists, while treating a patient for gum diseases, have foretold a general nervous collapse from the change in the appearance of the gum tissues. As to what extent this phenomenon may be used as a diagnostic factor remains to be demonstrated, but it is certainly worthy of consideration.

We find in the treatment of abscesses and ulcerations of the mouth that our therapeutic and surgical procedures meet with but indifferent success in individuals who are suffering from general debilities, anemias, tuberculosis, Bright's disease, neuresthenia, etc. The tone of the tissues becomes low and local treatment has little or no effect. It is, therefore, the duty of the dentist in treating such cases to put the patients under the care of their physicians to the end that their general metabolism may be improved, which will have a directly beneficial effect upon the local treatment.

Lesions and inflammatory conditions of syphilis are often found in the oral cavity. As these are highly infective, it is but justice to the dentist that the attending physicians warn him of the condition of such patients who, to his knowledge, are receiving dental attention. The dentist, in treating cases of this nature, should exercise every precaution against the contraction of the infection by himself or the transmission of it to other patients.

During the past few years we have come to consider that even those strictly dental diseases such as caries and erosion of the teeth and pyorrhea of the bone and soft tissues are directly dependent upon the general metabolism to a greater or less extent. In the case of caries of the teeth it has been conclusively demonstrated that the active principle in this process is lactic acid fermentation of carbohydrates taking place upon surfaces of the teeth which are habitually unclean. The lactic acid thus formed is held against the tooth by a gelatinous film, producing a decalcification and destruction of the tooth substances. At first sight it might appear that the process depended wholly upon the hygiene of the mouth, and that if the teeth were kept clean they would not decay. We find, however, that this is not the case, there being some factor in the process other than hygiene which determines the immunity or susceptibility of the individual to tooth

caries. Numberless cases are seen in which the same individual will change from a condition of immunity of the teeth to caries to a condition in which their teeth decay rapidly. This change takes place without any apparent alteration in the oral hygiene; it is often synchronous with a loss of health and is very frequently found during the period of pregnancy; it also occurs at certain times of life independent of any illness. Moreover, there may be a subsequent change from susceptibility back to immunity, which may or may not be coincident with recovery from illness. Such change may take place in a healthy individual at certain ages of life. A common illustration of the latter is found in the cessation of the teeth to decay in youths arriving at the age of early maturity. So caries, being primarily a process dependent upon oral hygiene, is also influenced in its manifestations by the general bodily health. Just in what manner this modification of caries by systemic conditions is brought about is not known, but it is believed that it is by some change in the salivary secretions by which the pabulum upon which the bacteria live is affected.

Erosion of the teeth is now generally considered to be dependent upon systemic conditions. The acids in the saliva which produce this wasting have their origin in some general fault of metabolism. They may come from the stomach in cases of acidosis of the gastric secretion, or they may be secreted from the salivary glands in the form of sodium and calcium acid phosphates, which are usually found in connection with suboxidation of carbohydrates and phosphaturia. In such conditions the physician might aid the dentist materially by studying the patient, correcting the faulty metabolism and restoring the saliva to a condition of alkalinity.

Pyorrhea, the disease which begins as an inflammation of the margins of the gums, going on to destruction of the soft and hard tissues about the teeth, causing the teeth to become loose and fall out, may also be dependent upon systemic conditions. We very often find pyorrhea in individuals who are afflicted with gout and articular rheumatism. It is stated that the same crystals of sodium biurate which are deposited in the joints are also found in the periodontal membrane, and there set up an irritation which may produce the manifestations of pyorrhea. So that a prophylactic treatment for gout will frequently abort pyorrhea, but this treatment must be accompanied by a maintenance of a strict oral hygiene by the dentist or the general treatment will have little effect upon the mouth conditions.

And lastly, we might mention those disturbances produced in the mouth by abnormal conditions of the nose and throat. Children suffering from enlarged tonsils or nasal obstructions are often mouth-breathers, and such individuals are very prone to irregularities of the teeth. The orthodontist recognizes this fact, and before he attempts to restore the teeth to their normal position he refers such cases to the rhinologist for treatment.

Having now somewhat superficially considered those correlated diseases which have their origin without and their effects within the mouth, let us turn our attention to those morbid conditions which originate in the mouth and cause secondary changes in other parts of the body.



Let us first consider the relation which the mouth bears to the general economy. The mouth has the function of receiving the food which is taken into the body, that of grinding this food to a sufficient fineness that the digestive fluids may readily act upon it, and finally that of mixing the ground food with the saliva, which contains enzymes capable of changing starch to sugar and albumin to albuminose. For the accomplishment of this work the normal adult mouth contains 32 teeth with 134 occluding surfaces. In mastication the anterior teeth tear off large pieces, which are carried back to the bicuspid and molars for division and grinding. Normally, the muscle and connective tissue fibers are simply divided finely, but the carbohydrates and starches should be thoroughly ground and triturated with the saliva—thus breaking the cellulose covering of the starch and allowing the diastase to act upon its contents.

When any of the teeth are lost, or if those present are not in normal occlusion, the number of occluding surfaces is materially decreased. In such cases the mastication is incomplete and the process which normally should take place in the mouth fails of its accomplishment.

Considerable light has been thrown upon the effects of improper mastication by a report of fecal analyses made by Prof. A. Michel, M.D., director of the Royal Dental Institute, Wurzburg, Germany. From a large number of examinations, he makes the statement that a man who is minus his molars will have large quantities of unbroken starch globules in his feces, and if he is minus his bicuspid his feces will contain meat fibers. Restoration of the teeth in such cases corrected the malnutrition. This work has been corroborated by that of a number of men who have done extensive work in fecal analysis and shows very conclusively that the amylase of the pancreas is not sufficient to split up large quantities of starch which have escaped the action of the ptyaline, and that none of the digestive juices are capable of breaking up masses of meat fibers which have not been sufficiently divided in the mouth. So that in cases of imperfect mastication, whether due to an absence of teeth, irregularities of their position, or the habit on the part of the individual of bolting his food, in any case a large amount of the food ingested fails of absorption, an excessive tax is put upon the digestive system, and the economy is deprived of its proper nourishment. Any condition in the mouth, therefore, which prevents its normal function has a direct effect upon the digestion and assimilation of all foods.

The mouth may not only fail to properly prepare the food for ingestion, but may also mix with its infectious and contaminating material much of which will be absorbed in the intestine. A mouth which is in an unhygienic condition will contain masses of foodstuffs between the teeth and in cavities in the teeth. These masses of food become infected and are excellent culture media for a large number of bacteria. Pathogenic as well as non-pathogenic bacteria are found growing in such places, the specific bacteria for pneumonia, tuberculosis, diphtheria and golden pus being commonly found. Not only do the bacteria grow on foodstuffs, but in such

mouths infection is usually actively growing upon the tissues in the form of ulcerations, abscesses of the teeth and inflammations of the gums. As a result of this a considerable quantity of pus and desquamated tissue is set free in the mouth to pass down the digestive tract in the act of deglutition. Much of this infection is rendered inert by the HCl of the stomach, but there is no doubt that a certain amount of the infectious material and its products are absorbed into the general system.

The force of this fact is brought out very clearly in the work that is being done in a number of the large cities in the way of a betterment of the oral hygiene among the public school children. It is found in the public schools of every city that the teeth of the children were neglected and badly decayed, and their mouths in a general unhygienic condition. It was found that when these children received dental attention, their teeth cleaned and filled, and they were taught how to properly care for their mouths, these children became stronger physically and more active mentally. They had been suffering from auto-intoxication, absorbing putrescent products from the mouth, and when a hygienic condition was established their general health was improved. The benefits of this work have been recognized to such an extent that dental examinations are being made compulsory in the public schools of the large cities, and free dental clinics are being established for the benefit of the poorer classes.

In this connection Dr. Evans, Chicago Health Board Commissioner, says: "For a long time, in watching cases of scarlet fever, in order that the community might be protected, we watched the skin. We have learned now that it is more essential to investigate the conditions of the mouth, the nose and throat, and the teeth. All of these things should be watched." He states further: "We have learned that there is not so much danger of diphtheria from the child that is actively sick as there is from the child who has not been sick at all but who harbors the diphtheria bacilli. These individuals are capable of inducing diphtheria in others, because the bacteria may remain latent in the nose, the throat, tonsils, and in the cavities of the teeth; a fact which is not thoroughly understood by the practitioners of medicine."

From this we see that in all cases of malnutrition and inflammatory conditions of the digestive tract, the condition of the mouth may have considerable to do with the case. So that in the treatment of such diseases, the function and the hygiene of the mouth should be considered, and if abnormal or unfavorable conditions exist, their removal will often aid greatly in the treatment.

The malposition of the teeth not only interferes with mastication but has often a direct effect upon the respiratory tract. For instance, individuals having narrow arches and the teeth closely crowded have also nasal passages which are constricted. This condition arises in the development of the mouth. As the temporary teeth are lost the permanent substitutes should immediately replace them. The permanent being larger than the

temporary teeth, there is lateral pressure exerted upon all the teeth in the mouth and an expansion of the dental arch is accomplished. Not only is the arch expanded but, by reason of the roots of these teeth, which lie high up in the alveolus, the nose and whole face develops in unison with the normal mouth development. However, in case any of the temporary teeth are lost, either by caries or extraction, before the corresponding permanent one is sufficiently developed, a space in the arch will be made, the lateral pressure will be lost and the jaw will not attain its proper size. In such cases we have a crowded condition of the teeth and the face and nasal passages will be underdeveloped. The work of the orthodontist conclusively demonstrates that the enlargement of narrow arches artificially during the correction of malocclusion has the effect of developing the whole face and enlarging the nasal passages. They tell us, however, that one of the greatest causes of malocclusion of the teeth and underdevelopment of the jaws and face is the premature loss of the temporary teeth by extraction. The responsibility of this loss, I regret to say, lies at the door of the medical and dental professions alike.

Facial neuralgias arising from tooth and mouth diseases are very common. The pains are often referred a long distance from the seat of the trouble, and it is frequently with great difficulty that the origin is located. A large number of dental diseases may be responsible for pains of this order, such as caries of a tooth, inflammations of a tooth pulp, inflammations of the peridental membrane, abscesses, excrescences on the roots of teeth, impacted teeth, and many other conditions which may arise. To the observant practitioner of dentistry the diagnosis of these conditions is frequently simple, but occasionally it requires a number of consultations between the physicians and the dentist to locate the source of the trouble and to determine in whose realm the treatment of the case lies.

A dental disease which very often produces systemic disturbances is that of alveolar abscess. These almost invariably begin at the apex of a tooth deep in the alveolus and are caused by the infection and subsequent death of the pulp of the tooth. Being enclosed as they are by bone, their escape to the surface is often attended with much pain, either local or referred, and in case large amounts of pus are formed and the drainage is not free, considerable absorption of pus may take place. Occasionally abscesses of this type produce much cellular infiltration and swelling in the tissues of the face some distance from the source of infection. It frequently happens that the swelling or open fistula of dental abscess appearing in the tissues of the face is first presented to the attention of the physician for treatment. Many of these cases resemble carbuncles, boils, necrosis of the bone and even erysipelas so closely that they have been diagnosed and treated as such for a considerable time. It is deplorable that all physicians do not make the practice of referring cases of swellings and pain about the face and mouth to a dentist for examination and consultation before making a diagnosis. In case the origin is found to be dental, the dentist



can usually remove the source of infection and aid materially in the treatment of the case after preventing embarrassing and disastrous results.

Abscesses on the upper molars and bicusps frequently involve the maxillary antrum. The source of these infections is similar to that of the ordinary apical abscess, moist gangrene of the dental pulp, but the manifestations of the abscess, instead of occurring in hard bone, spread readily to the cavity in the bone and there set up an inflammation which is often of great severity. It was formerly the custom that such cases should be turned to the dentist for treatment, he opening into the antrum from the mouth cavity and irrigating through the aperture thus made. We now feel that this affection may be treated to better advantage by the rhinologist in a manner similar to the treatment of catarrh of the antrum. All cases of a mild type can be successfully treated through the nose, and those more severe cases in which it is necessary to open from the oral cavity, the rhinologist or oral surgeon are better equipped to do this operation than the average dentist. Should the tooth which caused the original infection be left in position the dentist must remove the infected pulp and make the tooth aseptic or the antral treatment will be of little avail.

Another pathological condition of the mouth which involves the interest of both professions is that of the mouth tumor. Occurring as they do, on the gums, on the tongue, and the lips, they vary greatly from the small benign epulis to the severe and malignant forms of sarcoma and carcinoma. Very often the dentist sees these conditions first, and if he is wise he will not judge the gravity of the growth by its microscopical appearance but will refer all such cases to a physician or surgeon who is capable and competent to make a true diagnosis.

Fracture of the jaw, occurring so frequently, is often best cared for by the surgeon, but in many cases a dentist is better qualified to determine the exact relation of the broken parts with respect to the occlusion of the opposing jaw. The dentist may often be able to secure the broken parts to good advantage by making use of certain bands and wires about the teeth, thus assisting the surgeon in the reduction of the fracture and the maintenance of proper relations until healing has taken place.

And lastly, I might mention that dental deformity, which so greatly alters the facial appearance and impairs the speech, hare-lip, and cleft palate. The dentist and surgeon are working side by side in our colleges, operating upon these unfortunate people and obtaining results which are worthy of great commendation. By the methods which are now used, the operation may be performed upon very young individuals, producing lips which are normal in form and palates which are complete, relieving the child from a severe handicap in life.

From these and many other instances which we might enumerate, it is very obvious that dentistry and medicine are very closely allied. Dentistry asks much of medicine. She demands that the body be kept in good health and all the functions in order, without which the oral treatment would be

of little avail. Dentistry also gives much. She keeps in order that vestibule of the human body through which all the food for the economy is taken in and prepared for digestion. They are then truly sister professions, working in harmony and cooperation, striving for the health and welfare of mankind.

## ABSTRACT OF DISCUSSION

DR. M. L. RHEIN: I am somewhat surprised to be called upon to lead the discussion on this subject, but I will do the best I can.

It has been a very gratifying thing to me to listen to the splendid paper that Professor Bunting has given this society on this subject. It has seldom been my pleasure to hear this complex matter treated in the intelligent way that it has been in this paper.

Now, during the consideration of the subject of pyorrhea that came up earlier in the session today, we heard two or three interjections by different parties in regard to the constitutional etiology of pyorrhea and the local etiology; and I believe that the reply to this much discussed and mooted question has never been given in a more intelligent and in a more concise way than has been given by the writer of the essay we have just listened to. It does seem to me that the time has about come when the futile discussion of that subject should cease, because it has neither a beginning nor an end, nor has it any good sense to the man who has intelligently studied the subject as Dr. Bunting has from a pathological standpoint. The extremist in regard to that subject on either side is entirely out of place, as he has so well shown. The absurdity, on the one hand, of a man getting up and saying that he could cure every form of pyorrhea is beautifully made manifest by what Dr. Bunting has just said; just as foolishly as the man who tries to say that there would not be any pyorrhea if there was not some constitutional derangement, and that all that is requisite is constitutional treatment to cure every form of pyorrhea.

But this paper is a beautiful illustration of the need of better education both on the part of the general medical man and the dental specialist. We may mince words in trying to cater to that feeling; that seems to be an heirloom to dentistry, to speak of it as two different professions, but it simply is a mincing of words. We are practicing medicine when we are practicing dentistry. This brings to my mind the last public address given by James Truman in New York City, at a dinner given to him two years ago. James Truman is a man, as you all know—those of you who have known him—of strong personal characteristics; a man who has been a fighter for principles all his life, and that is one fight he maintained all his life, that we were a separate profession; that we were dentists and that we had nothing to do with doctoring. The most impressive words I ever listened to was two years ago this winter, in his address at this dinner which was tendered to him. He said: "Gentlemen, you may not like and I do not like it"—or something to that effect—"but the handwriting is on the wall, and it makes very little difference whether you like it or not, but I plainly see that the dentist of the future must be a man educated, thoroughly educated, in every thing pertaining to medicine."

Now, when a man—those who know him as well as I do and as well as Professor Hoff has known him, and the older men in this society—finally changes his conclusion on a matter of this kind, it is a very portentous thing, to say the least. I do say, and have always made the statement, that the degree of M. D. is not the thing, the degree of D.D.S. is not the thing, the degree that a college confers upon a man is not the measure of that man's intelligence, nor of his capability. We simply have those degrees conferred because we must have some method of instruction; but I care not how that knowledge is obtained. If the diseases pertaining to the peridental tissues, or pertaining to diseases of the pulp, or anything out of the particularly mechanical work of the dentist, is to be intelligently understood, diagnosed and acted upon, the degree of

capability of the dentist to be able to take his position in that respect is determined by how much or how little knowledge he has of the body as a whole. We cannot separate a part from the whole; it is an utter impossibility. We have been trying to do that sort of thing, and it has been the one thing that has been keeping American dentistry in the background in the past twenty years. Any one who has studied the dental situation in Europe during the past ten years cannot fail to realize how far in advance they are in inculcating this principle in their methods of dental education; the necessity of the dentist understanding the general pathology of the body just as thoroughly as a man who practices on any other part of that body. Now, our great difficulty in this respect has been on account of the defect in the medical curriculum. In regard to our own work it is a very difficult task; because when the doctor comes out of his medical college, although he has been an interne in a hospital, he has been studying the human body practically with the exception of the mouth. He has tried to do something on the same basis that we have been working on, and consequently the general practitioner and the dentist find it a most difficult thing to get together. This is one reason why the average dentist, seeing the ludicrous errors made by the general medical man, feels and recognizes the ignorance of the medical man in this part of his work, in which there is no reason for him to be ignorant, and assumes a position of superiority upon that particular part. That in turn makes him ludicrous in the eyes of the medical man when he shows his ignorance in regard to pathologic conditions of the body as a whole.

Without wanting to take up too much time, I want to say this: this is illustrated to me on a great many occasions when it has been brought up in dental bodies, and they have calmly sat and listened to the absurd expounding of pathologic questions by dentists who seemed to have manufactured a science of pathology peculiar to themselves and at variance with that which is accepted by the entire scientific world. This could only be possible because of the ignorance of the audience as to the accepted scientific facts; and that is a thing that, if you ponder upon, some of you may recognize some of the men who are accustomed to this sort of thing. I know a number of our educators believe that this education can be given in the dental course; but it is not given there. And so it is that I am trying to draw a practical deduction from this beautiful paper, and the only deduction that I can see is that it ought to be a stimulus—a stimulus to us to endeavor to see that the education of the dentist is evolved as rapidly as it can be in a practical way towards this end; and at the same time we must realize that if this is to be accomplished we ought to say to our friends just as strongly as we can, in those communities in which we are situated, that the general medical men see the necessity of that same evolution in the general medical curriculum, so that the doctor and dentist are able to consult properly, because unless each of them have had special advantages outside of their alma mater, that is a matter which they are not capable of doing.

DR. C. N. JOHNSON: I had not intended to take part in this discussion, but I do want to pay a tribute to the author of that paper. That is one of the most clear-cut presentations of the subject I have ever listened to. I want to say also that there is developing today a community of interest between the medical man and the dentist, such as we have never before witnessed. That development is coming simply because of a better understanding between these two professions. It was a calamity, probably, in one way, that they were ever divorced; but I will say, Mr. President, that that divorce was brought about not through any notion of the dentist or desire of the dentist, but by the influences of the medical profession. In other words, when the dentists went to the medical profession, the medical authorities, and asked for representation in their teaching institutions, they were denied the privilege, and that forced upon the dentists of that day the necessity for developing dental institutions of their own. Let me say in that connection that Dr. Rhein said the greatest development had taken place in Europe in the last ten years, because the dental education was dominated by the medical profession. I say to you, when the medical profession dominates the dental profession it is to the detriment of the dental profession.



DR. RHEIN: I did not put it that way; I did not mean to say that, at least.

DR. JOHNSON: Dentistry in Europe does not develop as rapidly as it would if it were by itself and freed from the medical profession. I do not want to be misunderstood. I believe in the closest community of interest between those two professions. There has been a misunderstanding way back in '39 up to within five or ten years ago—a misunderstanding between these two professions, and the poor public has suffered as the result of that misunderstanding. I am thinking of the people that come to you and me for services. The people have not been so well served, from a medical and dental standpoint, on account of the fact that the professions have not been closer together. I do not care whether you call it a separate profession or not, so long as the people are cared for as they should be. There has been this difficulty in the past, that the medical man has not understood the factors of dentistry, nor has the dentist understood general pathology. That is coming about. In most places dentists are consulting more with the medical men and the medical men are taking off their hats today to dentistry.

Two weeks ago in the city of Chicago—less than that—through the influence of one of the best health commissioners that ever occupied that position (Dr. Evans), who was quoted by Dr. Bunting, a department in dentistry has been established as one of the regular health departments of that city. Why was that done? Simply because medical men knew, from their experience in the past, that there were factors connected with dental practice that were affecting the poor children of Chicago, and they are affecting the poor children of every other city, and it is time that the medical profession recognizes that; and I say the best service to the public shall result from the closest possible community between the medical and dental profession. The closer we get together the better for the public. Those children in Chicago are going to be served better in the future than ever in the past, simply because the two professions are getting closer together.

But, sir, I want to refer once more to that question of the medical profession dominating the dental profession. We do not need to hide our head when American dentistry is referred to. The best development of American dentistry was brought about by the independent college, which was established for the purpose of teaching dentistry. How many men have gone out with a medical degree who have not recognized the value and importance of dentistry, just as many dental students have gone out without a full knowledge of the pathology of the body. I am more hopeful than ever for the future service of the people from a medical standpoint and a dental standpoint, and I am glad to see these two professions coming close together. I call them two professions; I don't care whether you call dentistry a specialty in medicine or a separate profession. I simply want to see the men who are serving the people—either from a general medical standpoint or a dental standpoint—come closer together and consult oftener, and, as Dr. Rhein said, they cannot consult intelligently unless they are educated. There never was in the history of dental education a time when this factor of general pathology was more fully recognized and studied than today. So I see nothing to be discouraged about. While they turned us down at one time and would not accept us that is no reason why, if they come out and give us the right hand of fellowship, we should not take it.

DR. OAKMAN: There were so many pertinent things brought out by Dr. Bunting and our two honored guests, Dr. Johnson and Dr. Rhein, that there is but little left to say. But I wish to lay stress concerning the inspection and clinical care of the teeth of school children, the clinical work to be done for those who are unable to pay for dental services.

I believe the inspection should be done by dentists who, in turn, would do the clinical work as well. Physicians, to my mind, are not qualified to inspect teeth, for they know little about them. We all know that it takes years of experience to properly examine mouth conditions. Persons who practically spend their lives working in one field would naturally be better qualified to judge conditions than those who occasionally

view the same field. If dentists would concentrate their energies along this line and work as though they wanted it, I am sure success would soon crown their efforts.

In regard to neoplasms, we should be very careful to diagnose those cases at the very earliest moment, for it is a well-known fact that if they are not diagnosed early little hope can be entertained for the patient's ultimate recovery. So it behooves us to be ever watchful and secure early consultation in suspected cases. Many lives have been sacrificed by waiting too long. When cases of this type are found a radical operation is generally required.

Within the last couple of years a number of cases of Epitheliomata, Sarcomata and Carcinomata of the Antrum, as well as the Mandible, have come to me, but in most every case was gotten too late. When Cachexia and other constitutional systems are present the prognosis is generally bad. In some cases six weeks to three months from the onset of the disease, in very malignant cases, the patient's condition was hopeless.

Will relate in brief two cases. A man sixty-three years of age appeared with a swelling in the region of the first and second molars. Diagnosis, Carcinoma. A radical operation was done but the patient lived only four months.

Diagnosis, Sarcoma. A young girl thirteen years of age had a tooth extracted. A couple of weeks later the case was brought to me for operation. The lower jaw was removed at the articulation. The patient lived just three months.

The ulceration, pain and suffering from these kinds of cases is indeed pitiful to behold.

A young lady twenty-four years of age (school teacher) had a molar on the upper left side which persisted in causing some inconveniences. It began to get worse, but her dentist thought it would amount to little. The condition continued for two years. It had caused protrusion of the eye and the right side of the face was distended. A piece of tissue was secured and the pathologist pronounced it a Carcinoma. The jaw was removed and the patient died six months later. Carcinoma quite unusual in one so young.

In the treatment of pyorrhea, when the results are not satisfactory from time to time and can see no reason why results are not the best, I now make it a rule to inquire about the condition of the urine, if they ever had diabetes, etc. If questioning is negative, I generally have a urinalysis made and have patient properly treated.

It is difficult to secure good results unless the underlying conditions are eliminated.

In regard to the medical profession in its relation to the dental profession, I would state that we are all called upon occasionally to give advice in things dental to the general surgeon and to the physician. How frequently we have patients brought to us who have been suffering with neuralgia for months. Their systems are debilitated from loss of sleep and proper nutrition, and when we examine the mouth we find the upper or lower third molars are frequently the cause of this condition. Had the patient been brought to the dentist at first a few minutes' treatment would relieve him of all the trouble. I think the medical profession are beginning to understand it.

DR. BUNTING (closing): I have taken up so much of your time that I do not feel like saying more. I wish to say a word in appreciation of the manner in which this paper was received and the discussions which have followed. I appreciate greatly the way in which Dr. Rhein and Dr. Johnson have spoken of this subject. It was with extreme caution and some hesitation that I brought this paper to you. I spent a great many hours working up the subject in some such form as this, and I wondered whether it would be of any use to you. But it has brought out a discussion which has been helpful to me, and I know has been helpful to all of us. I just want to say this in regard to dental education: I believe that in our dental schools we must teach our students more general pathology, they must know the causes—the ultimate causes in the body which affect the mouth condition, and that is my business in Ann Arbor; I am trying to do that very thing, to have every one of our students know the symptomatic and systemic causes of mouth diseases and all of the general bodily conditions which have their bearing upon mouth disorders.

## SOME THINGS IN DENTISTRY\*

By E. H. Wicks, D.D.S., Detroit, Mich.

THIS IS inventory time. The merchant and the manufacturer are busy taking stock to ascertain just how much material progress they have made during the past twelve months. If the gains have not been satisfactory, an investigation of methods will be made, with a view to improvement.

I wonder if it wouldn't be a good idea for us at this time, as dentists, to do likewise? Our inventory will consist not merely in ascertaining our financial gains, but will involve a rigid self-examination. Satisfactory answer must be given to such questions as these: As a dentist, how do I measure up to the mark as compared with one year ago? Am I rendering better service to my patient today than then? Am I seeking to know and employ the best and most approved methods of operation? As a man, am I seeking physical, mental and moral development that will give me the place I should occupy among men?

This is a busy age. Many are the demands to which we are all required to respond. Unless eternal vigilance be our watchword, carelessness and neglect of duty are liable to creep into our lives and hamper our success all along the way.

When the patient presents, there is usually some specific cause for such visit to the dentist. It is here that our responsibility to that patient begins. The trouble which is manifest to the patient may be the least of those present in his or her mouth. If it be a child, there may be a malocclusion, which, though but slight, may be augmented with further development. Or it may be that from the character of the arch and the temporary teeth future irregularities may be predicted.

Two many times, I fear, either ignorantly or deliberately, we shirk our duty in these cases. Right here let me emphasize this point. Repeatedly, when the writer has called the attention of the mother to a condition of this kind he has met with the reply that Dr. So-and-So said they would straighten themselves. Gentlemen, if we are ignorant of what will happen in most of these cases, let us bestir ourselves and find out. If we do not, some day that patient is going to arise, not to call us blessed, but rather to censure for ignorance or neglect.

Cleanliness of the oral cavity must, at times, be brought forcibly to the minds of these young patients also. If in doing this we should let a grain or two of truth fall where it may, it might take root in the patient; it will do him or her no harm. For some of them may still be instructed along these lines.

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\*Read before the Michigan First District Dental Society, 1911.



This brings me to the adult patient. Many times the foul and unsanitary conditions present in some mouths are due in large measure to neglect of duty on the part of some dentist.

Pyorrhea, which, if taken in its incipiency, may be treated successfully, too often is allowed to progress until the treatment consists of extreme measures, or the teeth are hopelessly abandoned. We are so busily engaged in constructive work that we feel we have no time to devote to work for which we can hope to realize such small financial returns. More teeth are lost from this condition than from caries. This should be made very emphatic to the patient, and inasmuch as the time spent on this class of work is going to result in the saving of the teeth, the patient should be given to understand that the fee should be as great as that for the most skilful operation of a constructive character. Indeed, the conscientious treatment of pyorrhea is more exacting and causes a greater drain upon our energy than almost any other class of dental operation.

Closely allied to this is the subject of mounting or adapting the porcelain and the gold crown. How does that crown look today we placed last January? Let us examine it. Alas, it is disappointing. Instead of the smooth, healthy pink gum clinging to the tooth, we find a congested, spongy gum that bleeds at the slightest touch. That proximal filling that we inserted has an overhanging margin and we have been a little careless about the point of contact. In consequence, the food lodges and can scarcely be removed. I wonder if we can't exercise just a little more care the next time. It may require a little more time. Charge the patient a little more money. That extra money will buy them more, in this case, than it could possibly do if directed in any other channel, and will bring more lasting benefit and comfort.

That root-canal we filled a year ago was done in a rather slipshod manner. Have we conscientiously tried to cleanse every root-canal to the apex, render it sterile and fill it just to that point? Now, we know it is a physical impossibility to remove the contents and fill every root-canal just to the apex. But it is only as we aim at the ideal that we may hope to approach it.

Thus we might pass down the entire list of dental operations and point out little things, or rather, what may seem trivial, but in reality mean much toward success or failure. The little foxes spoil the vineyards, and it is close and careful attention to detail that produces perfect results.

Just a word as to the dentist himself. To measure up to his best he must keep himself in perfect physical condition. Bright, cheerful surroundings tend to produce optimism, while dull and gloomy environment tends to depress. Let the office be a model in neatness and cleanliness. It will not only make us feel better, but the effect upon the patient can scarcely be estimated.

Above all, be the man. What the world needs most today is men—men who can stand four-square, men who have convictions and the courage

of their convictions, men who are clean in their social and business relations. Not always to such is reared a monument of wealth; not always does he meet the applause of his fellow-man. But these do not constitute real success. The greatest reward that can come to man is the satisfaction of a task well done and, at the end, that of a life well spent.

#### DISCUSSION

DR. CHAS. G. HAMPTON: I think this is just the kind of a paper that we have needed for a long time. It brings right home to us many, many things. One I have noticed during the last year especially, as I have had an opportunity to converse with one dentist and another, is what we are often called upon to do, as one of our most simple operations. I want to speak about it briefly. If we see a beautiful inlay, an artistic crown, or a beautiful piece of work in any part of the mouth, we are proud of it, but other patients, we find, have some work that we do not like to speak about favorably, which leads the thought to the one thing I want to speak about particularly, the amalgam fillings. There, I think, is the place where most of us place our neglect, if any, so I wish to emphasize the use of the rubber dam in every case, where possible, where amalgam fillings are inserted. I am surprised at the number of men who put in amalgam fillings without the rubber dam. I do not see how they can do it and feel, when they get through, that they have been just to the patient. If it is possible to put on the rubber dam we should do it. Without its use we cannot detect a chalky margin, even if you extend for prevention, and think the margin is completed. There will be chalky areas there that will not come out to view unless perfectly dry. Let us put on the rubber for our amalgam fillings this next year and carry out the spirit of Dr. Wicks' paper, "Be just to the other man."

DR. F. W. MACDONALD (Detroit): I don't believe in all of my twelve years' experience in dentistry have I known of dentists trying to do their best as they are today. I believe the line of demarcation between the good, faithful dentist and the poor, careless one has become more sharply drawn today than it ever has before, and I think in five years from now the public will be so educated as to the kind of dentistry they should expect that the careless man will have to look well to his practice or he will not have any.

I have been more particularly concerned, for the last year or so, with the first point that Dr. Wicks made, and that is in regard to detecting malocclusions in childhood. That is one thing that I claim I myself was very derelict in detecting when I was in general practice. We are so busy in constructing things for the mouth that we fail to take notice of the troubles we might prevent. We are busy making inlays, putting on crowns, constructing bridges, and we forget that there is such a thing as educating the patient, or educating yourself, to the point of preventing a good many of the troubles the only remedy for which must be the construction of crowns and bridges later on. Take pyorrhea, for instance, as Dr. Wicks mentioned. There have been so many cases of pyorrhea developed in your own practice that you would hate to admit it; patients, possibly, who have been under your treatment for perhaps the last ten or twelve years, and all at once you discover that there is a pocket down on one side of the tooth, that only our Dr. Wood, possibly, could cure; but it is a fact that I have seen cases of pyorrhea develop from an incipient stage to a most aggravated form, in my own practice, through my own carelessness, and I must admit that I was, to a certain degree, responsible for these conditions. I have had the same thing happen in malocclusions. I have had them develop right before me and never took the pains to tell the patient what these conditions would lead to until they were so well developed that the orthodontist found it was a complicated case. I believe if we, as dentists, took a little more pains to consider what our responsibility is to our patients we would all

be much better dentists than we are now, and the message Dr. Wicks brings us tonight is a most important one, and especially to the man who is trying to do his best.

DR. G. C. BOWLES: I do not know who the essayist was that the program committee had in mind, but I really am rather glad he failed because, as some of the other speakers have intimated, we have had a most excellent and timely paper, and at a timely season. I think, in his concluding remarks, Dr. Wicks hit the nail on the head exactly. He said we should try to measure up four square. That covers the whole thing. He meant by that, that we should at all times exercise the most conscientious effort of which we are capable, and as a consequence tomorrow we will exercise a little more conscientious effort than we did today, because we are growing, and effort of that kind makes us grow. Slipshod methods, of course, pull us down. We all know how easy it is, when a piece of work turns out poorly, to let it pass; it is not entirely satisfactory, but we let it go. It becomes an effort to admit that it is wrong and to make another appointment with that patient to correct it. It is hard to do it, but if we fail to do it we have suffered a moral loss, there is no doubt about that.

Speaking of increased effort, I want to just mention what has been the result of some of my own efforts in the last year or so. We all know how difficult it is to properly cleanse and fill root canals, and, with the rest of you, I have made extra effort to do better work. I have recently had a little experience myself. I have had a crown that gave me trouble and was taken off. The roots were again treated and filled and another crown put on, and that, too, taken off, an abscess developing twice. Good, conscientious effort was put on that tooth each time, and yet the radiograph showed that the roots were not opened up more than two-thirds of their length. This has led me to make greater efforts, and as a result I have had more trouble than I had when I was more easily satisfied. That sounds paradoxical. As an example, I recently opened up a lower molar and treated it, conscientiously, but it did not settle down where I wanted it in order to put back the crown I had taken off. I worked on that tooth until I felt certain it was sterile and filled to the apex. Still the tooth remained tender, so I sent the patient to Dr. Graham and he sent me back a radiograph on which was written the words, "Root canals filled, and then some." Well, they were. The gutta percha point in one root protruded something less than three-quarters of an inch beyond the apex; another one not quite so far. But that was an extreme case. I am glad I made an effort even in that case. I erred on the right side anyway, but that is one of the difficult things to do, and it is one of the things that we can neglect so very very easily—proper treatment of root canals.

Many of us have been in the air lately because of that English physician's so-called "tirade" against American dentistry. When we know what the man really said we don't feel quite so huffy, because we find everything he said has been said before by our American dentists. It is too true that many of the bridges we put on result in the loss of the abutments sooner or later, maybe sooner, and that systemic conditions are resulting from slipshod methods of canal work and root preparation that ought not to result at the hands of trained men. As Dr. MacDonald said, I really think we are all making the greatest effort to do better work; I am sure we are, but we simply have got to sustain that effort and each year do better work, and measure up, as the essayist said, four square to the ideal man.

DR. JAMES J. BROWNLEE (Detroit): I don't think I could add anything to what has been said on this subject. I think that Dr. Wicks' paper was certainly timely and worthy of our conscientious attention, as he brings to our attention the fact that some carelessness has been practiced by all of us, and it certainly is up to us to make an inventory of ourselves and our work. Now, I think as to the cases upon which we must exercise more care, that subject has been pretty well covered, and I will not attempt to say any more on that.

DR. M. E. STAFFORD (Detroit): I am sure Dr. Wicks' paper is a paper that could be appreciated at any time, but more properly at this time than at any other time, be-



cause this is the latest time in our lives that it could be presented. We are all more or less improving or going backward. If we are not improving we are certainly going backward.

A thing that occurs to me is the assertion that we should always put the rubber dam on in placing amalgam fillings. Of course, it is best to get the cavity dry and to keep it dry, but I think it can be done in some cases, especially in an upper, without putting on the rubber dam, to which so many patients object. I think with a proper use of napkins and saliva ejectors, and those things, the cavity can be thoroughly dried and maintained in a dry condition for a sufficient length of time to enable one to put in amalgam fillings right and to show up any defect in the cavity margins while it is being done.

I am sure Dr. Wicks' paper has been appreciated by us all, and it is just such a paper as we could expect from Dr. Wicks.

DR. CHARLES P. WOOD (Detroit): Dr. Wicks' paper is most certainly a success. I have always had great respect for Dr. Wicks and think a great deal of him as a man and a dentist, but when I read the notice that he was to give us a paper on some things in dentistry, I said to myself, what can he say about some things in dentistry? The essayist speaks of the necessity of our improving year by year. Dr. MacDonald says there is a wider demarking between the slipshod dentist and the man who tries to do his best, and Dr. Bolles says if he tries to do his best he will surely improve. How true this is. I believe this wider demarcation has come about almost entirely through our efforts to carry out the prophylaxis regimen.

If a man will conscientiously and diligently push his preventive measures, and when patients come, instead of putting his whole attention to painting up the walls in the superstructure, if he will look well to the foundations and not leave any irritating substance around the roots, he cannot help improving on all inlays, fillings and crowns and bridges. Dr. MacDonald has impressed the importance of seeing to it that children's teeth are put right by the orthodontist. I want also to impress the great importance of correcting irregularities in our mature patients. Not a little of the pyorrhea trouble can be prevented by seeing to it that too much strain is not put upon some tooth or teeth and too little on others—shortening some teeth, lengthening others.

Dr. Wicks speaks of the dentist taking better care of his health. How better can we do this than by putting every mouth in a cleanly condition before operating in other lines?

DR. W. R. ALVORD: There are a couple of points I wish to mention. One is, the examination of the oral cavity. I have found, for myself, that I have improved prophylactic conditions of my patients by making an accurate record of the conditions as they existed when I took the case; and as the patients have returned to me from time to time, comparing the new conditions with those recorded. Where conditions have been improved I have traced them, in many cases, to ideas that I have attempted to give in regard to keeping the mouth clean. In examining the mouth, I think that there is considerable else besides the teeth that needs the attention of the dentist. For instance, the soft tissues, and even back in the tonsillar region. While that does not fall under our jurisdiction as operators, still we have greater opportunities, I think, even than or as great opportunities as physicians, to observe the conditions of the tonsils and use preventive measures. Another point: I believe in constantly increasing the strength of the argument to patients for having various lines of work done. What has appealed to me in my recent reading is not so much the loss of a tooth; we can get something to eat, even if we have no teeth, and our systems would be more or less nourished, though of course not so well, but the thing which has impressed me is an observation which was recently made by Dr. Warthin in Ann Arbor. He took a tooth which was a recent extraction from a normal adult, a man about twenty-two, I believe, and from the carious molar he infected several sterile cultures. I cannot tell you how many, but there were several contagious diseases that he grew from the infection from that culture. Among

those that I can recall were pneumonia and diphtheria. Of course, if the germs are in a normal mouth, probably they would be simply waiting for a systemic condition favorable to their development. If that is a condition that exists, I think we cannot go too far with a strong argument for cleanly conditions in the mouth.

DR. O. W. WHITE: I want to take just a moment. Dr. Wicks has given this society a very appropriate message at a proper time. In the discussion, Dr. Wood emphasizes the attention which should be given to malocclusion existing in the adult. To me, the one part of Dr. Wicks' paper which should receive the greatest attention is the paragraph referring to malocclusion existing in the mouths of our young patients.

In your examination of young patients observe carefully the occlusion, and if there be any interference with normal development, eliminate cause at once. This preventive treatment will repay you ten-fold more than any other preventive treatment you can pursue in your practice.

Parents look to you to give them the best service possible, and future success of dental operations and health of tissue will depend on occlusion.

The number of causes of malocclusion are few and every one should be able to recognize them and see that they are eliminated before serious harm has resulted to dental arches.

Do not, because your practice is large, neglect the child patient. You may be more interested in cast inlay, bridgework, etc., and this branch of your practice not appeal to you, but remember by taking time with the children you are laying the foundation for a healthy and useful mouth. Such mouths are always a pleasure to watch develop and guard against damage throughout life. And you may have the fruits of your labor shown in the second generation; and what greater tribute can come to a professional man than to have in his practice two generations of one family who have depended on his ability and skill for years and are so well satisfied that they entrust their children to his care. I would want no other credentials than that as to the success and ability of any dentist.

While we should do what is possible for adult cases of malocclusion, the greatest amount of good will be accomplished by preventive treatment in our young patients, and I want to underscore this one paragraph in Dr. Wicks' paper.

DR. WICKS (closing): Mr. President, I am sure I appreciate the sentiment that has been expressed by a number of you in regard to the paper and the things mentioned therein, especially those remarks relative to improving from year to year. It has been my earnest endeavor, especially since I came to Detroit, to improve from year to year and from day to day, and see if I could not do that operation just a little better today than I did it yesterday, and I want to say this, that some of the good work I have seen come from the hands of other dentists has been a great inspiration to me. If I see beautiful inlays or amalgam fillings, nicely contoured and polished, it is an inspiration to me and makes me endeavor, when putting an amalgam filling or a gold inlay in that same mouth, to do it just as well, or a little better, if possible. When work of such character comes to us from the other fellow it gives us a higher opinion of him and a greater degree of respect for his skill. A man of ordinary ability, if he apply himself day after day, is bound to improve; nay, more, succeed. It is not necessarily the man who is the most skillful or the man who is the best mechanic who is going to succeed, but it is the man who plugs every day and keeps at it. We know in college it is so. It is not always the brightest man who comes out at the top, but the man who gets down and plugs day after day, working out his own salvation. I believe it is the same with us, that if we want to become proficient in our practice it is only going to be by honest, earnest, conscientious effort every day. I believe in the education of our patients. If I am going to cut away a tooth for "prevention," unless my patients are familiar with what I am doing I try to explain to them. Sometimes I start in with a small approximal cavity, and by the time I get through with it, it is a pretty large cavity. If they are not familiar with my methods they may wonder why

I have cut the cavity away when the other fellow did not. Not long ago a patient came to me who had been buffeted around from one dentist to another. The dentist who had been doing his work had left the city; and he told me he left one fellow because he cut his teeth too much, and left another one because he did not cut them enough. I remarked to him that I would venture the assertion that the man who cut his teeth too much did better work for him than the other fellow. Then I explained to him why the one cut them away; that it was done for prevention—if you could extend the margin of that cavity where it could be thoroughly cleansed with a brush the margin would be more apt to stand. It is reasonable to suppose that a recurrence of decay will result along the joint or union between a metal filling and the tooth substance, where it cannot be cleansed, if a perfect tooth failed to prevent decay in the first place. Hence, extension of margin to an area which is easily cleansed. If we educate our patients as to our methods, they will then understand why our fee is a little higher than the other fellow's.

There was another point, that had slipped my mind, and which I want to speak of. Dr. Wood mentioned it—the question of prophylaxis. I agree with Dr. Wood that the recent progress made in this department has done a great deal toward improving our methods. I remember, in my early practice, a patient came to me and I inserted an amalgam filling in an approximal cavity, I will say. I paid little attention to the point of contact between those teeth. As a consequence, I presume if any of those fillings are standing up today they have food particles lodged between them that are decidedly uncomfortable. I never realized, until I had a condition of that kind in my own mouth, where I was constantly having particles of meat, or anything like celery strings lodging between the teeth. It is a most uncomfortable sensation, and if any of you find such a condition when a patient presents, by all means correct it, because it is certainly a disagreeable condition.

I think oral prophylaxis has called our attention to those things and taking care of our cavity margins, so that the gums will present nice, healthy conditions. These may seem like small things, but they are the things that count after all, for they tend to preserve the mouth in a perfectly normal and healthy condition. I thank you.

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### PORCELAIN MOLAR CROWN.\*

By Dr. A. C. Runyan, South Haven, Mich.

This is what I call a porcelain molar crown. We frequently find first permanent molars, either superior or inferior, that are so badly broken down that it is practically impossible to fit a shell crown with any degree of satisfaction.

My manner of procedure is to put them in a healthy condition and fill the nerve canals, and if the gums overlap I place a pledget of cotton saturated with sandarac varnish and crowd the overlapping gums out of the way. I leave it there for twenty-four hours. Then with a carborundum stone and burs, I trim the ragged edges all smooth and remove all decayed particles that can be removed. I enlarge the nerve canals for receiving pins, so that they will draw properly. I next take a bite impression tray and warm up enough modeling compound to fill the tray, take a piece about the size of a filbert and crowd well down into the depression, to cover

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\*Given as a clinic at the Southwestern Michigan Dental Society, 1911.



the roots thoroughly and well, then, with that which is on the impression tray, take the bite and remove it all very carefully. Then the pits of the holes which were bored for the pins will show in the modeling compound. I then mount that on the articulator, remove the wax, and the depressions will show where the pin holes are in the model. Then with the same drill carry those as deep as they are in the roots of the tooth. Then take a 20th century or any anatomical mold tooth of the proper shade and size and grind the buccal wall to fit as accurately as you can. Next, take iridio-platinum wire or platinoid wire for posts and insert them in the holes in the roots of the tooth; then, with your inlay wax thoroughly warm, press over the pins. Take your crown and crowd down over that and close your articulator and adjust your articulation so that it occludes properly, and trim off the margins just as you would like to have it for a completed job for casting. At this point, if you wish to, you can try it in the patient's mouth to prove up. Then invest and cast as you would an ordinary inlay, either with gold, Weston's metal or acolite. It makes one of the most sanitary and complete restorations that I know of. You can cast gold direct on to a T. C. tooth.

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## FAILURES WITH BUCKLEY'S FORMOCRESOL

By Chas. Shepard Tuller, D. D. S., New Orleans, La.

**I**T IS NOT my purpose to inflict upon you a long-winded essay, but briefly give the reasons for some of the failures experienced with Buckley's Formocresol.

The action of this remedy when sealed in the pulp chamber of a tooth whose canal contents are putrescent is twofold. On the one hand it is so powerfully disinfectant that it kills the germs of various kinds which abound there, and on the other it chemically unites with some of the gases which are by-products of the putrefactive process, rendering them inert, so that further swelling, pressure and pain are prevented.

This action is positive and uniform in all cases where a proper technique is observed. This technique begins with the remedy itself, which must be a fairly *fresh* preparation. Formalin is a solution of Formaldehyde in water, and like all such solutions, gradually gives off the gas, so that an old mixture of Formocresol or even a fresh mixture made up with an old solution of less than 38 per cent Formaldehyde, cannot be expected to give results. I am quite certain that this is one cause of failure in the use of this valuable remedy, and one easily remedied.

Another cause of failure with the remedy is neglect to place in the tooth a sufficient quantity of Formocresol to give a prolonged effect upon the bacteria, or enough to supply q. s. of Formaldehyde gas to unite chemically with the gases of putrefaction and render them inert as rapidly as they are formed. Be sure and seal in enough, or all that you can get in without producing pressure in applying it.

We are frequently confronted with cases where it is impossible to seal in more than the most minute quantity due to the great loss of tooth structure. In these cases where one doubts the possibility of applying q. s. it is better to dispense with it altogether and resort to Solidified Formaldehyde. Of this last substance a piece not larger than the head of a brass pin wrapped in a little cotton may be gently placed in the mouth of the canal and hermetically sealed and left not longer than 24 hours.

If you have experienced failure with Formocresol look to your technique and observe the greatest care in its preparation and use. Make a fresh solution at least once a month. Don't put a broach in a putrescent canal before you disinfect the contents with the remedy. Don't throw up the sponge because of one failure. Your first gold filling was probably not a success, either. Surely a remedy so constantly used with success by thousands of dentists must have real virtue.

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## BACTERIOLOGY OF THE MOUTH

By George Lemkourtz, M. D., Morgan City, La.

IN PRESENTING this paper I feel that I am taking up a lot of your valuable time which could be put to a great deal better purpose than listening to a paper which, I must admit is, for a large part, plagiarized.

In trying to discuss such a subject as the Bacteriology of the Mouth, I am considerably handicapped by the fact that what little work on this subject I have done has been altogether in the general practice of medicine, and not in the special consideration of any particular region. Inasmuch as I promised our good friend, Dr. Bernard, that I would contribute something, I do not intend to disappoint him and would, therefore, beg your kind indulgence and ask not to be criticized too strongly by any of you, as most of it is borrowed from the observation and researches of others in both the medical and dental professions.

The mouth seems to be splendidly arranged for the propagation and even protection of bacteria. There are cavities, cavers and crypts not easily cleaned, which are moist and warm, and more or less food is deposited near or in these spaces, which forms suitable pabulum for the growth of bacteria. Decayed teeth, or painful roots of the teeth, cause the patient to avoid that side of the mouth in masticating. One or all of these conditions may be present and allow the growth and propagation of pathological bacteria in the mouth. In fact, there is hardly a general disturbance which does not interfere with the normal health of the mouth, which means good teeth, clean, pink mucous membranes, good digestion and sweet breath.

When one remembers how generally the breath of an individual is not sweet, how generally the tongue is not clean, how generally there is

some tooth or teeth abnormality in a patient, and how incompletely most patients cleanse their mouths and teeth, we should not be astonished to learn that not only are harmless bacteria more or less constantly present in the mouth, but that pathological bacteria occurring in the mouth are the cause of many serious diseases.

The normal flora of the mouth protects against the invasion of pathogenic germs under normal conditions. The bacteria do not injure the teeth unless their products are allowed to accumulate, in which case the acids generated by the bacteria cause the destruction of the teeth; therefore the best plan to adopt in the care of the mouth is to insure the mechanical cleansing to remove foodstuffs as well as the products of these ever present bacteria.

Besides the aseptic bacteria which are to be found in the mouth, the pneumococcus, the bacillus of diphtheria and the bacillus of tuberculosis as well as those of many other infectious diseases are frequently found.

Dr. Miller has stated that an unclean mouth harbors 1,140,000,000 bacteria that may be cultivated, many of which are pathogenic; and it has been shown that some of pathogenic bacterial may cause not only the local conditions of caries, pyorrhoea and other diseases of the mouth and teeth, but also intestinal indigestion and putrefaction, and may even be a source of pernicious anaemia.

These bacteria, harmless or harmful, which are present in the mouth, may be inhaled, swallowed, chewed up in the food or sprayed during sneezing or coughing; and may also be offered gratuitous to friends who are kissed. Of course it may be said that a healthy gastric juice will kill most of the germs that are swallowed, but anything which interferes with the normal amount of hydrochloric acid in the stomach may allow these germs to be carried into the intestines unharmed.

Certainly the subject of the bacteriology of the mouth is almost an inexhaustible one; therefore I will only have a few remarks to make on the subject with special reference to any particular one. By far the worst bacterial condition which is dealt with daily by every member of the dental profession is that known as Caries of the Teeth, which has been known to exist for ages, even being found in the teeth of Egyptian mummies of the remotest periods.

Perhaps no subject in the dental profession has been given more—or, better still, as much consideration as this one. From time to time different investigators have ascribed first one and then another cause as specific of this disease; but it is now known positively that the germ, *caries fungi*, or otherwise known as *streptococcus media*, is the definite cause.

The germ grows in places where food lodges on the teeth, such as pits and fissures on the occlusal surfaces of molars and bicuspid, faulty places in the enamel, in the approximal spaces of all the teeth as well as around the gum margins. It is very rare that we find decay where there is constant cleansing of the teeth by the lips, tongue, and the surfaces of the teeth opposing one another.



The *streptococcus media* throws out a protecting covering called the "gelatinous plaque," which protects them from the disturbances that would be met with in the ordinary use of the mouth; under this covering these germs secrete an acid which first attacks the cementing substances of the enamel rods which makes the enamel look opaque, similar in appearance to the white spots on the finger nails.

This opaque appearance of the enamel is due to the rods sticking up by themselves without the cementing substance between them, which destroys the translucency. Then the germs follow the course of this acid destruction and finally enter the cavities produced in this manner. By constant reproduction of this secretion the process goes on until the whole tooth is destroyed unless attended to in time.

The only eradication of a focus of this condition is purely mechanical, accomplished by thorough excavation of the affected area and proper filling of the cavity. Prophylactically it can be handled by means of frequent and proper use of the tooth brush, which demonstrates conclusively that this, one of the worst bacteriological menaces to good and healthy mouths and teeth, can be handled successfully better surgically than medically.

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## ORAL PROPHYLAXIS IN GENERAL PRACTICE.\*

By J. H. Armstrong, D.D.S., Belding, Mich.

IN THIS PAPER I do not expect to advance any new scientific facts, but would rather endeavor to stimulate an interest in the proper care of the mouth in general practice.

Prophylactic (from Greek *prophylaktikos*); *pro* equals before, plus *phylasso*, to guard or fortify; it means, according to the "Standard" dictionary, operating, to ward off, especially disease. We who belong to the great class of general practitioners must look upon prophylaxis more seriously as the days go by, because our patients are becoming educated along this line, as well as others, and they expect us to do something by way of prevention.

I think every patient should have prophylactic treatments at stated intervals. You will see the beneficial effects in the mouths of those patients who have had this treatment for two or three years. I have found in these mouths a decided tendency to greater resistance in the breaking down of tooth and gum structure, to say nothing of the increasing interest by the patient in the welfare of their mouths and the added respect for the dentist. I believe prophylaxis will be the foundation upon which the superstructure of the general practice will be built, in the near future. The dentist who will start out in practice by convincing his patients that he is endeavoring in every way to prevent all forms of tooth trouble will gain

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\*Read before the Michigan State Dental Society, 1911.

the confidence and respect of his clientele. These two factors, confidence and respect, are very necessary in the building and retaining of a practice.

Patients come to my office and ask, "What is prophylaxis?" "Do you give prophylactic treatments?" etc. They have heard or read about it and expect, of course, that their dentist is progressive enough to know all about the new things. Others I take the time to tell what prophylaxis will mean to the welfare of their mouth and general health.

Right here I would like to say, in corroboration of a statement made by Dr. Ed Spalding, in a paper read before the New York Dental Society last year, that "Two patients in my office, one from New York and the other from Massachusetts, after I had elaborated upon the beneficial effects of Oral Prophylaxis, made this remark: 'Oh, our dentists back East explained this to us and said it was only a fad of the West.'"

Ten years ago I attempted, in a modest way, to practice prophylaxis as I knew it then, and the patients who received this treatment at that time have proved to be my very grateful patients up to the present. Some of these mouths have been kept in nearly normal condition during that period. Comparing the very limited knowledge I had of the work at that time with the yet limited knowledge, it seems as though no mouths ought to lose their teeth at this present time.

In my work I take prophylaxis to mean: operations on the crowns, around the necks and roots of the teeth, the taking off of crowns that are not preserving the interdental spaces and replacing them with ones that do preserve the space and articulate, the removal of fillings with overhanging edges and that are not properly contoured; the construction of bridges to hold teeth in their relative positions; construction of splints and adjusting of ligatures; the treatment of root canals, polishing of fillings, and last but not least, the instructions to the patient relative to their part in the work. In fact, nearly every operation the dentist is called upon may have some bearing in prophylactic work.

Looking at it in this light, is it not very important that we of the general practice give it due consideration? If we do not, how can we do our patients justice and render them the best service possible?

The conscientious dentist is constantly trying to improve his skill and knowledge so that he may be of more service. Anything short of this shows lack of ambition and honesty and a tendency toward quackery.

There are some objections offered by the general practitioner, one or two of which I will enumerate. One says his patients will not pay for the treatment because they have been in the habit of getting their teeth "cleaned" for little or nothing. Another says he cannot afford to invest in a set of 100 or 150 instruments for this purpose, and another that he cannot afford to devote the time necessary for this work. To the first objection I would say, it is easily overcome with the more intelligent patients, and the others will follow, if you will take the trouble to explain the benefits to be derived from the cleanly condition of the mouth obtained

by removing all foreign deposits, and that the expense would be no greater than the placing of so many fillings, which would require the same amount of time. And how much more desirable to have the mouth in a state which affords the greatest resistance to contagious disease, caries, pyorrhea, etc. To the second objection I would say that in my own practice I work, with a degree of success, with about two dozen instruments, selected from different sets. I have Dr. Jungeman's set of six, and the others I have selected from time to time from different sets because they seem to fit my hand and suggested their adaptability. I buy the points and adjust them to the handles so that they may be replaced.

Now as to the third objection, that of having the time: I find that perhaps 10 per cent of my time is devoted to prophylaxis and the treatment of pyorrhea, and in the future I expect that more time will be devoted to this work. I feel that our object should be to see how well we can take care of our patients, not how many we can care for in a more or less careless manner. If we establish a reputation for being very thorough in what we do, I believe it will keep a steadier stream of practice coming than any other kind of reputation will bring. I would like to mention here that I have been very grateful to Dr. C. P. Wood of Detroit, who is to discuss this paper, for the many words of encouragement and valuable suggestions he has given me in the past. He has always admonished me to "stick to it, because it is worth while."

There is no departure of our practice which requires more careful and thorough effort than prophylaxis, whether it be the removal of foreign deposits on the surface of the crown, around the neck, or along the root of a tooth (under deposits I class plaques, stains, salivary and serumal calculi and food debris), the scraping and polishing of small decalcified spots on the labial and buccal surfaces of the enamel, or the care that should be taken to avoid the unnecessary injury to the gum and gingival organ; or the polishing of all overhanging edges or fillings so that they will present a free and smooth surface in the line with the tooth. This trouble is more generally found in connection with inlays and amalgams along the gingival margin and under the gum. In these places it is best to separate the teeth, examine the margins to see that they are perfect, if not then polish until they are in perfect line with the other surfaces of the tooth.

In this connection the overhanging edges of crowns and lack of proper contour might also be mentioned. Crowns that have mesial and distal surfaces, parallel or converging toward the occlusal edge, are little better than nothing, because in the process of mastication food is wedged between and not only causes the patient discomfort but particles are forced down under the free margin of the gum, where it soon sets up an irritation. This is true of both porcelain crowns and crowns where gold is used. Every effort should be put forth to have our crowns not only articulate or occlude, but they should be of proper contour. Then the margin where the crown is adjusted to the root should present a smooth surface, so that it will not



afford a harbor for decomposition and disease, that the gum may continue in a healthy condition. I might mention here that all fillings should be brought to a high polish so that they will not afford a catching place for foreign substances.

The preservation of space, created by the loss of one or more teeth, should be taken care of as soon as convenient, so that the remaining teeth will continue in their relative positions. This is best done by means of bridges so constructed that they will have a perfect articulation with the opposing teeth and are hygienic. It is a very hard matter to keep teeth and gums in a healthy condition when they have lost their normal positions. The adjusting of a splint some times serves in holding teeth in position which, owing to articulation, are bound to be shoved out of place. This may be done by attaching the splint to some tooth or teeth which may be so locked by occlusion that it cannot get away.

Now as to the *modus operandi* when a patient presents herself for prophylactic treatment.

This is work that not only requires the greatest of care but also the greatest of cleanliness. The instruments should be sterilized after every operation, a clean towel for your patient and a clean napkin for the operator to wipe his instruments on while working. I use a porcelain-lined dish with a solution of green soap and bichloride of mercury, with warm water to rinse off my instruments while working. The green soap prevents the bichloride of mercury from corroding the instruments, and the warm water takes the chill off the instruments, which chill sometimes annoys the patient where you are working around the neck of a sensitive tooth. If the gum around some of the teeth presents an inflamed appearance, I use a little pheno sulphonic acid on a pledget of cotton swabbed around the neck of the tooth, and allow it to stand while I am working on others not affected in this manner. This method seems to soften any deposit under the edge of the gum, renders it less sensitive and the gum seems to heal more readily afterward. Then I begin by working on one tooth at a time, removing all foreign matter; deposits, stains, food debris, or little decalcified spots that are not deep enough to suggest a filling, with my instruments, keeping them rinsed in the solution at hand continually, covering the mesial, labial, buccal and distal surfaces as far as the spaces will allow, then the palatine or lingual surfaces in the same way.

Then I take an orange wood stick with points cut in the shape of a wedge, concave on one side, and use them with a paste made of pumice flour and either an astringent antiseptic compound of

Tincture of Myrrh,  
Oil Gaultheria,

Zinc Chloride,  
Alcohol and water

or glyco thymoline and water to polish the rough surfaces, then with the engine and some rubber points and brushes I cover all the accessible surfaces with a little of the paste; following this with a piece of ribbon silk into which I have incorporated a little of the pumice paste with my thumb

and finger. This reaches surfaces not accessible with the orange wood stick or points. After this I thoroughly spray the teeth and gums with a little of either of the former antiseptics to remove the pumice and debris from around the gum margin and mouth. This also leaves a pleasantly clean sensation in the mouth. If the patient has fillings, crowns, bridges or cavities which are not right, recommend attention, explaining the necessity, following this with the instructions to the patient; because they must be our constant assistants in this work or we fail to accomplish desired results.

A good tooth brush, not too soft, with the bristles so arranged that they will cover not only the outer surface but the spaces between as well, used with a rolling motion from above downward and from below upward so that it will brush the gums as well as the teeth, also with a circular motion, as in scrubbing, forcing the brush back well along the molars so that the posterior teeth will get their full share of the brushing. The teeth require brushing after meals, the first thing in the morning, and the last thing before retiring. Some simple dentifrice after meals, which will aid in removing particles of food, is all that is deemed necessary, but before retiring they should have a thorough cleansing with some antiseptic because during the night the mouth is enjoying a period of rest and is closed up so that it forms a regular incubator for the hatching of all kinds of troubles. A little dental floss should be used at this time to clear away any remaining particles of food from between the teeth. Where there is an acid condition found and a tendency toward breaking down around the necks of the teeth I recommend, after they have been cleansed in the manner indicated, that they rinse the mouth thoroughly with "milk of magnesia," forcing it through the interdental spaces, spit out the surplus but allow the film which clings to the teeth to remain all night. This treatment has a corrective influence on the tendency toward cavities in this position. In some of these cases I have tested the saliva, which is oftentimes ropy and viscid, and found it to be lacking in cyanide of potassium. I have administered potassium sulpho cyanide in one half-grain tablets, two each day for ten days, then allowed some time to elapse and repeated the dose. This I found to be a material help in the correcting of this tendency toward breaking down at the necks.

I admonish the patient to follow instructions carefully and return in a month's time so that the progress may be noted, and then I set another time for examination if it is not necessary to go over them again at this time. If there is much work to be done in the mouth only a few teeth should be cared for at any one sitting, as it becomes very tiresome to the patient and they are liable to lose interest. (We should always remember that time, patience and perseverance accomplish all things.)

Every general practitioner should be in position to do this work intelligently. We ought to be able to say to a patient, if they are going to some of the other towns in the state, "Go to any good dentist, in the locality, and he will give your mouth proper care."

If I have said anything which may prove an incentive or will encourage my brothers of the general practice to take up this work, I will feel well repaid for this weak attempt. I feel that this paper may at least afford a source for general discussion and I hope to profit thereby, as there is so much to be learned along this line.

#### DISCUSSION

DR. C. P. WOOD: I cannot criticise very much the very excellent paper written by a man I believe to be practicing oral prophylaxis, conscientiously and with intelligence and discrimination.

He begins by considering it from the standpoint of the general practitioner, and while I do not think it reasonable to expect that, other things being equal, the general practitioner can do it as satisfactorily as a specialist, he most emphatically will improve the conditions of the soft tissues, and his work all along the line will be done in an entirely different manner, and not with the idea of how much he can do in a day or how many patients he can see in a day, but how good he can do it. He will very soon realize, after trying to scale and polish according to Dr. Armstrong's ideas of a perfect condition of each individual tooth, how impossible it is to do justice to the case with crowns driven down under the gums where it is impossible to know when it fits and when it does not fit, and the next time he fits a crown he will see to it that the edge of band stops where the root is largest and does not impinge on the attachment of the periodontal membrane. He will not do this or that operation at so much per, but will charge according to how much time is required in each case, and if he goes at it with determination in one case, and finally brings about a healthy condition of all tissues of that mouth, he will be so impressed with the improvements over former conditions that he simply cannot continue further in the old way of practicing.

Right here I want to express my appreciation of Dr. Hoff's efforts in this direction. In his new terms of expressing the true idea of prophylaxis he begins with his rescue work and then when this is thoroughly accomplished and the mouth begins to take on normal tissue appearance, he begins his preventive work; this means that there is distinctly two parts and considerations in oral prophylaxis.

Instead of having patients drop in at any old time for treatment and always having one or more or an office full of patients waiting, he will take his time for each case and work absolutely by appointment and not be crowded and have to say to himself, "well, this will do," and slip the crown on before he is sure it fits the root or the opposing tooth or the contact point is right, and hurry to do the same slipshod work with the next patient. As Dr. Armstrong says, the general practitioner must look on oral prophylaxis more seriously and not think that he can allow patients to come in as they feel like it, but must establish in the patient's mind the great importance of the work and insist that they come when they are called for, or with extreme regularity; or for sure he will be on the retrograde and be and is a back number in prophylaxis before he starts the game. We must get out of our heads that patients can't or won't pay for our very best efforts in prophylaxis. We have no trouble making our patients accept our advice in having a gold filling or an inlay in the place of amalgam, or a jacket crown in place of some other, if we believe in it and can do the operation right. The superstructure is of no more permanent value than the foundation; the personal equation must enter into every operation or it is likely to fall short of your best, and if we don't use some of our force of character and gray matter in persuading patients to have just what we believe is best, we certainly are mediocre dentists indeed and fall far short of the best thing and bring disrepute upon our noble profession. We all have to learn some things by mistakes and the writer, for one, has caught on very slowly in the matter of making proper charges for oral prophylaxis. I figured that I was getting about \$4.00 to \$5.00 an hour for my regular work. I believed in prophylaxis



heart and soul after seeing, through the courtesy of Dr. Spaulding, a large number of Dr. D. D. Smith's patients, which were as pretty as pictures, and wanted to give my patrons the benefits and could not take the time or did not have the patience to persuade my patients as much as I was persuaded myself. I began by charging anywhere from two to three dollars for regular monthly sittings, and figured that I could do the necessary preventive work in from one-half to three-quarters of an hour, but after working my head off nearly for a few years, have been obliged, in order to give the time necessary, to say to these patients, "I find that I am hurried too much, and I want a little more time, and it will be necessary to charge you more." Thus far I have had no dissenting voice.

I began just pushing right through for the whole appointed time, polishing every tooth all the way round regardless of how much the individual tooth needed and not taking proper time to show the patient where he was failing to keep this or that tooth properly clean by his own efforts, and showing him how he could accomplish it.

Now, don't forget that, as Dr. Spaulding says so eloquently in his paper before the New York Society a year ago, true prophylaxis consists as much if not more in getting patients to do for themselves as in doing for them. We should spend at least one-third of the time appointed for our strictly preventive work in pointing out with the hand and mouth mirror the defect in their efforts, and putting into their hands and heads the proper means of bringing about the desired result. In other words, we must learn if we would practice prophylaxis to the best advantage, to take pleasure in talking and showing our patients a great deal of what we understand as we proceed with our manipulative work. Dr. Armstrong says patients should have prophylaxis at stated intervals. I will go him one more and say at first they should have treatment every month and some of them, for a time at least, much oftener, until they get your idea of the case. To be sure, if you are persistent in your work in directing them they will soon be nearly as much master of the case themselves and the general conditions will improve so much that they will not have the need of so frequent attention from you; but I have found that they get the habit and see the results so plainly and believe in it so thoroughly that they will come then anyway, for at this stage they know for a fact and practice what they know, that "a stitch in time saves nine" and want your assistance in detecting the least break anywhere in the mouth. Dr. Armstrong speaks of gaining the confidence and respect of our patients. Do you want to cinch your patients so that no lesser light than yourself can get them away from you, even though you do charge them what it is worth for prophylaxis? If so, just study the prophylaxis program, fill yourself brim full of it, and then the first patient that sits in your chair go at them and show them what you believe. If they apply for some fillings or crowns and bridges, unless they have an aching tooth, take the mouth mirror and hand glass and a very fine slim probe, and whether you know it or not, start out with the idea of finding some pockets. You will most surely do so in 90 per cent of adult mouths. At least show them the deposits and inflamed gums; you will even surprise yourself at what you will find, and by the time you are through the patient will forget what they came in for and so will you, and the patient will say, "go ahead and see what you can do for these gums," and when you have finished your rescue move in prophylaxis your patient will have such confidence in you because of the improved conditions that you will be able to do 100 per cent higher class work all along the line and get paid for your extra effort, and if you have properly explained everything as you went along you will have made an everlasting convert to prophylaxis.

This talking to your patients is a great thing; it is the most important end of prophylaxis and, as the essayist says, "You can do nothing without the patient's efforts," how will they make the effort unless you tell them the why and the wherefore?

The up-to-date dentist stands today preeminently the educator of the people in all matters pertaining to oral hygiene, and if you are a poor talker, practice up, talk more to your patients and work less, for they have the mouth to look after at least thirty

days to your one. Dr. Armstrong says, "For means of prophylaxis' sake, take off all those crowns and fillings which are not preserving the interdental spaces, which are not fitting the roots or are not articulating properly with the opposing teeth." The writer rarely begins a case for prophylaxis without removing some crowns and fillings and resetting and refilling after the rescue work is done. This is much more quickly done than to try to work around these overhanging edges.

Right here I find the most prolific cause of the disturbance of the foundations of the teeth is devitalized roots unfilled or imperfectly filled. Many of the worst pockets, primarily supposed to be from deposits and purely a pyorrhea, yield readily to treatment after the removal of septic matter from canals and refilling in the best manner. In these cases, many times, one or more roots have to be removed, and sometimes it is necessary to remove the entire tooth. Right here, as the Good Book says, "It is far better to enter into heaven with one root or one tooth in the mouth than to be cast out with all the roots or teeth" which are in a septic condition. I believe many times much time is spent with molars in trying to get all deposits and necrosed tissue out of the bifurcations, when it would be far better to remove one or more roots, and in case of lower molars be able to treat them as single rooted teeth, or crown the separated roots by themselves, rather than be uncertain of results and leave all of the roots in the jaw. I believe most emphatically with Dr. R. G. Hutchinson of New York City, that unless you can be sure of getting a tooth healthy in every way, take it out and put your efforts on the better ones. Dr. Armstrong's ideas of instruments are all right. I believe that many men are kept from doing prophylaxis simply because they can't do it like Dr. Youngman, or Dr. Smith, or Dr. Jesse James, or Dr. Good, or any other of the great lights in dentistry. There are more ways than one to skin a cat. Don't hesitate because you don't know how, or can't do it just like some one else. Go at it in your own way, just do it, and if you find some place you are unable to get deposits off, get the instrument required and finally you will have a system all your own and will surely get satisfactory results. The writer has never observed two operators doing the same thing in the same manner; why should all expect to do prophylaxis in the same manner?

For a time, as patients come for regular treatment, it is very helpful in locating plaques to paint all surfaces of the necks and crowns of the teeth with iodine solution; this will show them up so that you make no mistake in getting them all off. Show the patient and explain that the iodine discolors only where deposits are attached to the tooth, and encourage them to greater efforts with the brush and floss. At the next sitting do the same thing and note improvements.

It is surprising how many dentists are careless about holding the teeth in their normal position in the jaws; they will allow spaces to exist where teeth have been removed without even a suggestion to the patient as to the terrible results to the articulation of other teeth. Here is where the orthodontist has been a great stimulus to the ordinary dentist. He never allows a space to remain. When the work of correcting irregularities has been completed the patient is referred at once to their dentist to have all spaces bridged to avoid all moving of the teeth in the future, because he knows that upon the holding perfect articulation in that mouth depends its health. I rarely see a case where teeth have been allowed to move in the sockets, that a pocket has not been formed on the side towards which it moved. The orthodontist's work plays a very important part in this prophylaxis scheme, just about one-half all serious trouble with the gums is brought about by malformed jaws, crowded, over-lapping teeth, one pushing the other out of position, bringing undue pressure on some teeth, not enough on others, lack of proper masticating surfaces, all of which can be and should be avoided by referring to the orthodontist early. If the orthodontist is consulted and allowed to do his work well, a great part of the prophylaxis specialist will be avoided. The writer, as far as possible in his work in prophylaxis and treatment of pyorrhea, practically never allows a space to remain anywhere in the mouth. The advent of the inlay

and short post attachment, in place of covering the whole tooth with a gold shell, make it quite simple to fill these spaces and keep the normal condition about the necks of the teeth.

Experience of those who have made a thorough study of prophylaxis serves to drive home the idea that we must learn to distinguish very minutely between a healthy gum and otherwise. Some patients have such a high power of resistance and recuperation that after very superficial scaling and polishing the gums will take on quite a healthy appearance to the casual observer, when in reality the deposits have only been partially removed—the upper layer, as it were. Right here, as Dr. Armstrong says, it is much better to treat one tooth at a time, finish it thoroughly before touching the next. Every tooth has four sides and a great many concavities and variations to the roots. If you keep all sides and variations and angles of one tooth in mind at one time, you do extremely well, let alone trying to keep in mind and scale a half dozen or more at once. If Dr. Armstrong had made no other point, especially in pyorrhea treatment, his time would have been well spent. In pyorrhea treatment, especially, the writer never expects to touch a tooth after the one sitting, so far as getting the original deposits off the root portion. Of course, it is possible to skip some, but as a rule we do not where one tooth is worked upon at one time exclusive of all others.

Before the mouth has been even rid of salivary deposits, or anything done except the use of the spray with some good antiseptic solution, the gums are in a very soft, pliable, flabby condition, allowing of more ease in obtaining access to the bottom of those pockets.

Dr. Armstrong makes a good point when he says begin with your best patients, or your most intelligent ones. If you do this, they will soon all be your best and most intelligent. The others will be eliminated. You will not have time for the others. The best ones will consume all your time and you will be respected more and more in the community as a new and higher type of dentist. The place where prophylaxis should really be pushed most is with the children and younger patients, for as the saying goes, "it is hard to teach an old dog new tricks." It is likewise easy to establish the habit of mouth cleanliness with children after we have filled all cavities and put their mouths in general good conditions. Keep them coming every month and keep at them until they have the habit established of thorough brushing and the use of the floss. Insist on use of floss, for with its use you will get results in most mouths impossible without it.

It is a surprising thing, but a fact, that about 9/10 of general practitioners will not recognize pyorrhea in a mouth until some tooth or teeth get into a hopeless condition, then we find that the whole mouth is affected and some roots beyond repair, as a rule. Any practitioner who will take a probe and go over all the teeth searching for pockets, and when found treat them or refer them to a specialist in whom they have confidence, will have the everlasting gratitude of their patients.

I have many patients say to me, "I do not see why my dentist has not told me a long time ago about this trouble." I have to say to them that they should consider themselves fortunate that he has told them now, for it has been the fault of the system of teaching that no attention was paid to the trouble, and again that the profession has persisted in the idea that it is constitutional and incurable so long that it is hard for them to be convinced otherwise. I believe we should stop even thinking that it is purely constitutional and go at it locally and do what we can. Saying and treating it as constitutional and incurable because of systemic connections has never accomplished much, and the majority of cures made today are made by men who treat it absolutely from a local standpoint. Dr. Hartsell of Minnesota College, starting out with the firm belief that all pyorrhea was constitutional, after most thorough investigation in hundreds of cases, concludes that pyorrhea is purely local and curable by local means in 80 per cent of cases, and that prophylaxis is the keynote of modern dentistry. Dr. Smith says that prophylaxis absolutely prevents pyorrhea, and that proper removal of all deposits will cure any case of pyorrhea, and he proves it with the goods,



They say there is nothing new under the sun, and just so in prophylaxis; men scattered here and there have had foresight enough for many years back to do nearly what we are preaching today. What we want to do here today is to put our ideas together and make this prophylaxis regime so practical that every progressive man will do as Dr. Rhein of New York and Dr. D. D. Smith of Philadelphia and others have done so long.

Before I turn this discussion over to some greater light, I wish to emphasize again the importance of showing the patients just how to take care of their mouth. I have a patient in mind, a man of 55 years, whom I corrected for not brushing properly after I had finished treatment for pyorrhea. When I called his attention to the inside of the lower teeth, that he had not brushed them, he looked surprised and said, "Why, I never knew it was necessary to brush the insides of my teeth." This goes to show that we must take it for granted that no patient knows how to best brush his teeth. I believe that much better results will be obtained and much time saved if we have brushes and powder in our office and, taking these materials in our hands, show the patient how to brush every part of the mouth, then we won't be disappointed in after sittings to find that they have not used what we directed at all, or in the manner we directed.

DR. BOWLES: 'There is just one point that I want to make. I understood Dr. Armstrong to say "every one" should have regular prophylaxis. I want to emphasize what Dr. Armstrong said; that every one should have prophylaxis, particularly the dentist. When patients come to me for the prophylaxis treatment and they say, "Who has it done?" I say "I have it done." That is the very best argument that you can use. If you have confidence in prophylaxis, have it done yourself, and you don't need to argue long with your patients. That is what I want to say. One dentist can perform this for another; everyone has some one in his community who can do his work, and if you can get this fact before your patients that is the best argument that you can use.

DR. LOEFFLER: I want to add a few words to what has been said. When he says prophylaxis fails unless the patient has been given instructions in the nutritive problem, he strikes the key note. If those tissues have been put in shape to recover, they will not recover unless the cells are furnished with proper nutrition to take care of that new condition. I believe that is just as necessary as to give a patient lots of fresh air, the right kind of food, and proper mastication.

DR. OAKMAN: I think what Dr. Wood said in regard to talking to your patients is an important thing. But I think there is great danger of falling into the habit of talking too much, and I don't know of anything that is more troublesome to the patients than to have the dentist buzzing in their ear all the time. We have heard that in other walks of life. A man will go into a tonsorial parlor and he will close up like a clam, all for fear that the barber will start to talk. I have seen and known busy men, men of affairs, who come to a dentist and don't want to be bothered by a lot of rag-time talk. I mean by that, if the dentist has to say anything, he can say it in a few words. In the long run, I think Dr. Bowles struck the nail right on the head. I heard of an instance where a very influential man went into an office and the dentist started out by throwing out his chest and telling him, in great medical terms, what pyorrhea alveolaris was, and mentioning some other medical terms, and the man did not know what he was talking about. The man finally said, "Doctor, I don't know what in h— you are talking about, but I have come to have my teeth treated. Now fix me up right and I don't care about the other part." I think it put a quietus on Dr. Jones—we will say Dr. Jones—for some time to come. As the Irishman says, there is "raisin" in all things. If we will be a little reasonable we can cut it down to a minimum.

There is one thing I want to emphasize, and that is in regard to the brushing of the teeth. I think if every man, when he goes home, will start out with his patients

and say, "How do you brush your teeth?" they will say, "As I was told to brush them for the last ten years." "Yes, I know, but how do you do it—just like this, up and down?" I will venture to say there is not one per cent of the patients that come to our offices that know how to properly brush the teeth. Nine out of ten brush their teeth up and down. That is not the proper way. It should be a rotary motion, and downward and upward—not up and down. Secondly, manipulate the gums, massage if you please; we can't put too much stress on that.

DR. HOWELL: There is one point of this paper which strikes a sensitive cord, and that is the significance of this subject to the application of crown and bridgework. I think I am making a true statement when I say perhaps there is not one cause that has been greater in the destruction of the soft tissue than the wrong application of the principle of bridgework.

It seems to me, then, the point of great importance in bridgework is in making some artificial substitute which is going to do away with all deleterious effects. That means, first of all, the proper treatment of the soft tissue, putting it in perfectly normal, healthy condition before we proceed with any technical work. Then it means, second, a man must have the highest ideal of the bridge to be inserted in that location, to do away with any unnecessary irritation which may arise from the construction. What does that mean? It means almost absolutely the discarding of the band and dowel crown and the insertion of a plate and dowel. It means also that the plate and dowel shall be so constructed that it does not extend over the top of the root, so that it will make it possible, for example, in scraping the root, to remove the deposits which collect underneath the gum. It means, also, in cases of posterior attachments that the old telescopic crown should be discarded, and in its place there should be used some form of partial crown attachment. In other words, use some scheme whereby we are going to preserve the normal condition of that tooth at the gingival line, which, ordinarily speaking, is the restoration of the abutment to its perfect anatomical shape. It further means the perfect restoration of the interproximal spaces, which can be done only by the reproduction of the full lingual contour to all dummies, and also the exaggeration of the mesial and distal contour so as to increase the size of the interproximal spaces.

DR. RHEIN: Mr. President, I know that it is very late, but the remarks of Dr. Howell have brought me to my feet for a few minutes.

This subject is one that I have given some little attention to in the past ten years, and I agree very strongly with what has been said in regard to the importance of the question that was brought up as to the specialists in the treatment of pyorrhea. In my opinion, such a thing is not only a misnomer, but absolutely impossible. It is the greatest absurdity that has ever been perpetrated upon dentistry. You may have some one connected with you closely who may devote his entire attention to it, but no man can possibly and properly serve a patient alone as a specialist in this line, meaning by that, that he devotes himself entirely to the local treatment, because the treatment of disease of the periodontal tissue means the proper use of everything that we know of in dentistry, and if it is to be properly applied along the line which has just been stated, why it must be applied under the direct observation of the dentist. It is impossible to send such a patient back to another dentist and have your directions carried out as they should be.

I thoroughly disagree with Dr. Howell's conclusion, that in order to treat the periodontal tissue it is impossible to have the band and dowel crown, or to use the telescopic bridge. But I do believe that where the numerous malocclusions are corrected and restorations necessary in order to have the maxillae properly perform their function, it is important that these maxillae are so treated that they shall perform the function which for some time they have lost. I am talking about missing spaces, and that can only be done by the application of saddle bridges, or something of that kind, and can only be properly inserted when they are made removable; I mean when the patient, in

the course of massaging the gums, etc., can remove these. They should be removed, if necessary, three or four times in a day, with the ease with which a ring is slipped on and off the finger. The abutments should be nothing more than locking devices for the purpose of having the maxilla do the functional work which Nature has intended it to do. Under those circumstances the form of bridgework which he says is impossible is perfectly possible, because they are removed when the patient comes for prophylactic work. There is no more difficulty in treating such a case properly by the prophylactic operator than it was before that bridgework was originally constructed. In fact, in all those cases fixed bridgework is a thing that is to be deplored, unless it is made in the form of a splint that leaves a large surface, and the objection to that is that in those circumstances, under such conditions, while it is the lesser evil, it should never be used if possible, because the abutments have an unnecessary strain thrown upon them, and the maxilla have no opportunity of having their lost function restored to them.

I trust Dr. Howell will pardon the personality of my remarks, but I simply wanted to illustrate the different point of view, possibly, and the impossibility of having one's idea carried out unless it is carried out under the dentist's own personal observation and direction.

DR. ARMSTRONG (closing): There are just one or two things that I want to mention, and that very briefly, as the President said.

One is the benefit that it is to the general practitioner to do this work, along with his other lines of work. I find I cannot today do my work as I did six or seven years ago. It was then done much more carelessly than it is today. I notice things today that I had not the slightest conception of at that time—simply overlooked them; and I find it is impossible to do a "job of cleaning the teeth," as it has been done in the past. When patients come to have their teeth cleaned they say, "Doctor, I want my teeth cleaned; I have about twenty or twenty-five minutes to stay, and I want my teeth cleaned." I have to take that twenty or twenty-five minutes to explain what they ought to have done.

I would like to mention, for Dr. Bowles' information, that I said *every one* should have prophylactic treatment, the dentist, the physician, the lawyer—everybody, it doesn't make any difference; mouths are relatively the same.

Dr. Oakman brought out a point I overlooked, and I was glad that he mentioned it, and that is the massaging of the gums. I instruct my patients to massage their gums. Dr. Rhein has made a very strong plea, I think, for the general practitioner, to which class I belong, in his argument that the dentist who does prophylactic work ought to be in a position to dictate the different modes of taking care of wrong conditions in the mouth. I thank you.

**W**HAT the world wants is friends. What the church wants is friends. What hearts want is a key. When our Lord began His earthly ministry He gathered about Him a little company of friends. One friend spoke to another, one friend brought in another. We are too unfriendly in our church life. We are too ready to confuse the sin and the sinner. We may hate and abhor sin as much as we please, but for individual sinners we should have not merely tolerance, but a spirit of tender sympathy and of loving comradeship.

There are lonely hearts to cherish  
While the days are going by.



## THE RELATION OF THE ORAL HYGIENE MOVEMENT TO THE MUNICIPALITY.

### INTRODUCTION

On Friday, April 26, at a meeting of the Cincinnati Dental Society, the papers and discussions following were presented.

The audience consisted of various public officials and others interested in the Oral Hygiene movement, in addition to the members of the society.

The Experimental Class referred to in the papers consists of a regular class of fifty children in the Sixth District school.

A series of psychological, physical and dental tests were made at the beginning of the school year. In addition to this the attendance, behavior, scholarship, appearance, manner, etc., were recorded. The social surroundings of the children were investigated by the school nurses, teachers and various social workers.

This procedure was followed for two entire classes of the same grade—the one the “Experimental Class,” the other the “Control.” In due time these tests will be repeated and the results recorded and published to demonstrate the necessity as well as the practicability of “Mouth Hygiene.”

### Sociological Dentistry.\*

By Sidney J. Rauh, D.D.S., Chairman Oral Hygiene Committee,  
Cincinnati Dental Society.

Primitive man existed only for himself. His prime object was to procure sufficient food upon which to subsist and to protect himself against the onslaught of any enemy. He selected for his abode that environment which should best conduce to this situation. *The survival of the fittest* at this stage of his existence meant physical development, nothing else.

The club was his weapon. His limbs and organs were powerfully developed, should he have reached the age of maturity, as any defect would have made him necessarily a victim to a stronger foe. Disease was practically unknown, for he was unable to resist it and succumbed with little effort owing to his lack of knowledge as to its treatment.

Mentality was low, being sufficient to maintain his strategic position to collect the necessities for living.

What a change at the present. Civilized man exists through his ability to cooperate with his neighbors and to combat the various diseases, both physical and social, that have been brought about through a so-called “*advanced civilization*.” Each day the problem becomes more complicated, the population of the world increases, necessitating that men form themselves into large communities with the necessary problems brought about by crowded conditions.

Active cooperation of each individual with his neighbor, and both in turn with the municipality, this with the state, the state with the nation,

\*Read before the Cincinnati Dental Society, 1912.

and the nation with the world at large makes for a comparative degree of comfort.

The change from the natural state, when force was the power, to the present, when mind rules, has been at a rapid rate, and the best brains have not as yet been able to combat all the evils brought about by the rapidly changing environment. In the development of the mental, the physical was for a time neglected, but a new movement, variously called "The Simple Life," "Back to Nature," etc., is upon us and will, undoubtedly, with the scientific methods that are being developed, produce a healthy individual.

*Survival of the fittest* now signifies *survival of the man who knows how to think* and also cooperation with the forces which have been developed through this evolution.

The City has brought about a problem which must be solved.

Man is not born equal. He must be made so. If a child is to play his part in the Battle of Life, he must have good mental, which means good physical development. The world recognizes this theory and it practically has no opponents.

We have a public school system, play grounds, parks, boulevards, lighting system, street cars, railroads, telegraphs—all working through co-operation for the individual, and even though some of these be privately owned they are of such magnitude that they approach the idea of public ownership. In this school system all children a few years back were on equal basis. We did not inquire into their antecedents, where they lived, how they were nourished, what their diseases, and today we have medical examination, anti-tuberculosis league, an abnormal, normal and subnormal classification, the start of a movement to rectify all conditions which conduce to subnormality. If a child has an infective disease the State compels him to stay away from school in order to protect the other individuals. If he has defective vision this condition must be rectified to place him upon a par with his fellow pupils. Should his parents be so poor that he has no shoes, the city, or some private agency, provides them. If he has not sufficient nourishment, the food must be provided, and that has already begun in instance such as the "penny lunch scheme." Should, most important of all, his home conditions be below par, a remedy must be instituted, tenement house inspection and regulation being the first steps in this direction.

The province of this paper in the end must necessarily bring about a discussion of the dental problem for other speakers, men and women of force will discuss these others, which have been merely mentioned.

We are specialists. Do we exaggerate the importance of Mouth Hygiene? It has been abundantly proven that 90 per cent, more or less, of the school children of the United States require dental interference. Because a problem is so large, should it be neglected? Scarcely a health movement today but what Mouth Hygiene is a necessary requirement for its full development. From where does the infection of tuberculosis come?

Where do the germs of this disease lodge, and where do they go? If only the physician who is interested in this problem could personally attend one of the inspections in our poorer schools he would be an immediate convert to this theory of tubercular infection.

The Oral Hygiene movement consists of three main divisions: *Educational Work*, such as public lectures, tooth brush drills, etc.; *Dental Inspections*, which notify the parents of the conditions in their children's mouths and also have a direct educational value by impressing the mind of the child, and the *Free Clinic*, which provides a means for the cure of these un-hygienic mouths for those who cannot afford to consult private agencies. The municipality must take over at least the latter part of the work if it is to be efficiently done. The invariable answer to this assertion is that "it cannot afford it." It costs a certain number of dollars per year to educate and maintain a pupil in the public school system. Should a child fail to be promoted, the expense of one year's education is added to that municipality. How many children in each community fail each year I leave for experts to answer—at least enough in a city the size of this to pay for not only the dental but other progressive movements that work to rectify these conditions.

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### **The Relation of the Charities and Corrections Department to the Dental Movement.\***

By Otto P. Geier, M. D., Director of Charities and Corrections, Cincinnati, Ohio

Much time could be devoted to the subject, but in the few minutes allotted to me I can but commend the Dental Society for its interest in the work of one of my departments, the House of Refuge.

The Superintendent of the Charities and Corrections Department is supposed to direct his attention to the human elements that are concerned in the conduct of public institutions. He has to take up the consideration of the individual and the application of the particular principles of well doing towards him, all principles of the science of sociology and philanthropy are necessarily involved.

There are four problems to be met by this new department: the problem of the indigent sick, which is taken care of in the Cincinnati Hospital and the Tuberculosis Hospital; the problem of the indigent adult, which is taken care of in the out-door poor relief work and in the Infirmary, also in the Municipal Lodging House and in the Municipal Free Employment Bureau; the problem of the offender, who, of course, comes in contact with the Police Department and finally reaches the workhouse; and last, but

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\*Read before the Cincinnati Dental Society, 1912.



most important of all, the Child problem—the problem of the boy and girl as exhibited in the Refuge.

We have heard most interesting reports tonight of the dental work in connection with the public school children. Those children belong to somebody out at the Refuge we are taking care of “nobody’s child.” While they belong to somebody, these somebodies are nobodies, and the city must take the place of the parent.

Among the many things accomplished at the Refuge since the first of the year, nothing has given me more pleasure than the introduction of and the progress made in the dental work. The moment our desire was announced for the dental work, your committee came forward with a heartiness and willingness to help solve the problem to a degree that was most pleasing. The complete chart of all of the mouths at the Refuge was made, an estimate of the expense involved in the installation of proper equipment furnished the administration and arrangements entered into to employ a dentist on half time.

As a physician, I can well appreciate how very helpful and needful this work is. Our first business is to restore these children to a normal physical condition, and to the extent that clean mouths and good teeth contribute to this end, the administration is deeply grateful to the gentlemen of this society who have made dental work at the Refuge possible, so promptly and so efficiently.

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### **Relation of the Wage Earner to the Dental Movement.\***

**By M. Edith Campbell, M. A., Member Board of Education, Cincinnati, Ohio.**

To convince the wage-earning girl that her health is her capital is one of our most difficult tasks. But the “care of health” houses in which most of us live are so uniformly composed of “glass” as to make stone-throwing somewhat impractical. We all of us have a dread of the long and serious illness, and, facing such a crisis, frantically grasp at any preventive measure. But the “little things” of prevention we either entirely ignore or give scant attention to whenever our chance convenience may be suited. It is true that the list of things we are told we must do, if we would keep ourselves in perfect physical trim, is a wearying one, and we are sometimes inclined to complain with the woman who said that if she did everything the specialist wanted her to do she would have no time for herself.

Nevertheless, the effort to emphasize along educational lines, the importance of many of these “little things,” must be made. That one such effort has been begun and has made such splendid progress in our own educational system has been brought before us this evening. The rule, which

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\*Read before the Cincinnati Dental Society, 1912.

has almost become a proverb, that if you cannot successfully manage your private affairs you cannot handle a public or business trust, needs to be taught the wage-earning girl—especially. For example, it is impossible to place a girl in a responsible position unless she understands *neatness* and *trimness* of dress. There is no surer way to teach her this requisite than to teach her the necessity for *neatness* of her physical “dress.” If she is taught in the public school, in her girlhood, the vital necessity of caring for her teeth, she will have had instilled into her mind at least one indelible lesson of cleanliness and neatness.

Through this medium she can also be taught the value of *thoroughness*, that even in the physical realm it is of no avail to care for one or two parts of the human engine, but that every part must be brought up to a standard of efficiency. And that the neglect of one part may cause the destruction of the whole.

The lessons of physical, industrial and economic conservation can thus also be brought before her. As we have heard this evening, one of the recent edicts of science has been the preservation of the first teeth for as long a period as possible, in order to insure sound “second ones.” If such a science could only be literally applied to child life, we might not now be facing so many human wrecks. If the wage-earning girl could be taught this fact through dentistry or any other science, taught it until she *believed* it with all the strength of aroused womanhood, she would be giving birth to stronger, healthier children than those of whom she is now the mother. The wickedness of our lavish expenditure of physical and industrial resources—an expenditure which is a criminal waste—begins too often at “home,” in the wealth of our bodies with which we are entrusted. The child must be taught that the supply is not inexhaustible, that every organ must be conserved, or the day of famine will face her. Hence she must be taught the value of teeth, as well as of eyes, or ears, or the entire theory, which is such a vital one, cannot be made a fundamental guide for her life.

The economic waste she learns very quickly, for she suffers a heavy financial punishment if she is not taught, as a child, a method of care for one of her greatest physical assets.

These few simple analogies, or lessons, seem trite and worn out, I know, but as yet we have found no method of reform, no class legislation that will produce the efficient, well-developed human being. As one after another of these methods fail because of the ever-present human equation we are forced again and again to the old, wearying way—the way of the individual. The individual must be taught that only through the perfect care, conservation and development of his physical and mental resources can he compel life to disclose its secret richness to him, and can he conquer its exigencies and rise above its sordid struggle. In such a training of the individual we believe the dental work in our public schools to be a most potent force.

(To be Continued)

# EDITORIAL

## SOME SOCIETY AND STATE DENTAL LAW SUGGESTIONS

The Massachusetts Dental Society has recently amended its by-laws to provide legal defense for its members against unjust malpractice suits. The new article adopted reads as follows:

SECTION 1. Active members of the Society, in good standing, shall be entitled, in accordance with conditions specified in the following sections of this Article, to receive, without personal expense therefor, advice and court services of an attorney or attorneys-at-law in the employ of the Society for the purpose of conducting their defense in any court in this Commonwealth when they are unjustly accused of malpractice.

SECTION 2. Active members of the Society desiring to avail themselves of the privileges provided in this Article shall make application therefor, in writing, to the Chairman of the Law Committee of the Society, and shall show to his satisfaction that they are members in good standing in the Society, and that all of their pecuniary obligations to the Society by way of dues and assessments have been duly discharged. They shall also furnish the Chairman of the Law Committee, at his request, a complete and accurate statement of their connection with, and treatment of, persons upon which complaints against them are based, giving dates of treatments, names and addresses of persons cognizant of facts and circumstances necessary to a clear and definite understanding of all matters in question, and shall furnish such other relevant information, if possible, as may be required of them by the Chairman of the Law Committee or the attorney of the Society.

SECTION 3. They shall agree not to compromise the complaint against them nor to make settlements of them in any manner without the advice or consent of the Society given through its attorney, nor shall they employ other counsel in aid of their defense without the consent of the Society.

SECTION 4. In the event that they shall, without the advice or counsel of the Society, determine to settle or compromise complaints against them, they shall reimburse the Society for the expense incurred in undertaking their defense, and in default thereof they shall be deprived of further privileges coming within the provisions of this Article.

SECTION 5. In the event that members of the Society shall make requests under the provision hereon, the Law Committee shall have the power to grant the same, or for cause to reject them, as the case may be, and to make such further provisions or requirements as may be deemed necessary for carrying out the purpose and intent of this Article.

SECTION 6. The Society shall not assume any responsibility for the payment of sums agreed upon by arbitration in the settlement of complaints, or awarded by court verdicts, or for making payments for any purpose whatsoever, except as specified in this Article.

SECTION 7. The provisions of this Article shall apply only to suits based upon professional services rendered subsequent to its adoption.

In Kentucky they have just enacted a new dental law, from which we will quote some of the special features.

Under the section "*Revocation of License*," the State Board of Dental Examiners may refuse to issue licenses or suspend or revoke the same for any of the following causes:

1. The presentation to the Board of any diploma, license or certificate illegally or fraudulently obtained, or one obtained from an institution



which is not reputable, or an unrecognized or irregular institution or state board, or the practice of any fraud or deception.

2. The commission of a criminal operation or conviction of a felony involving moral turpitude, or chronic or persistent inebriety or addiction to drugs, or if the person holding such license shall advertise to practice dentistry without causing pain, or shall in any other manner advertise with a view of deceiving or defrauding the public, or advertise the use of any drug, nostrum, patent or other proprietary drug or medicine of any unknown formula, or be guilty of any grossly unprofessional conduct likely to deceive or defraud the public, or which disqualifies the applicant to practice with safety to the people."

*Exemption from Jury Service:* "All dentists of this state shall be exempt from service as jurors in any of the courts of this state."

*Unlawful to Practice Under Name of a Company:* "It shall be unlawful for any person or persons to practice or offer to practice dentistry or dental surgery under the name of any company, association, or corporation, except those who have been in actual business for fifteen years or more prior to the 19th day of March, 1908, and every person or persons practicing or offering to practice dentistry or dental surgery shall practice under his or her own respective name or names only."

*Dental Reciprocity:* The board accepts certificates from other state boards whose standard of requirement is equal to that of Kentucky and in which the applicant has practiced dentistry at least five years immediately preceding his or her removal.

*Disposition of Fines and Fees:* "All fees, as well as fines, imposed and collected under the provisions of this act shall be paid to the secretary-treasurer of the Kentucky State Board of Dental Examiners for the use of said board."

*Druggists May Fill Dentists' Prescriptions:* "Legally licensed druggists of this state may fill prescriptions of legally licensed dentists of this state for any drug necessary to the practice of dentistry."

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## HOW TO LIVE LONG

The chief of the Bureau of Chemistry, Department of Agriculture, at Washington, has laid down five rules which he says will prolong life. They are: First, work well; second, eat well; third, sleep well; fourth, think well; fifth, play well.

This Washington expert follows up his rules by saying:

"It is practically impossible for a man to live a long life in a congested city. He is deprived of sunshine and pure air, both of which are absolutely necessary to good health and long life. Children should be especially favored in this way, and kept in the fresh air every moment possible. It not only promotes health, but wards off diseases like tuberculosis and pneumonia. We have too much artificial heat in our houses and offices. Windows should be wide open even in bad weather."

# LEGISLATION

## LAW REGULATING PRACTICE OF DENTISTRY IN KENTUCKY

ENACTED MARCH 1912

An Act in relation to the Kentucky State Board of Dental Examiners and to regulate the practice of Dentistry in the state of Kentucky.

Be it enacted by the General Assembly of the Commonwealth of Kentucky:

### **Continuance of Board and Manner of Appointment**

SECTION 1. That the Kentucky State Board of Dental Examiners heretofore created be continued, to consist of five practicing dentists, whose duty it shall be to carry out the purposes and enforce the provisions of this act as hereinafter specified. The members of said Board shall be appointed by the Governor from a list of three names, to be recommended by the Kentucky State Dental Association, at its annual meeting, and at the time of their appointment upon said board must have been actual residents and legally licensed practicing dentists of this state for a period of five years or more immediately preceding their appointment: Provided, however, That no person shall be eligible to appointment to said board who is in any way connected with or interested in any dental college or dental department of any institution of learning or dental supply business. The term for which the members of said board shall hold office shall be five years, provided the present members of the board in office at the time of the passage of this act shall continue in office until their respective terms have expired and until their successors are appointed and qualified. All vacancies in said board shall be filled by the Governor from said list.

### **Officers, Meetings, Records, Etc.**

SEC. 2. Said Board of Dental Examiners shall choose one of its members President, and one Secretary-Treasurer, thereof, at an annual meeting on the first Tuesday in June of each year. Said board may meet oftener if necessary, in the discretion of the board, at such places as it may deem proper, for the examination of applicants who may desire to practice dentistry in this state, and for the transaction of any other business that may come before it. Said board shall keep a record book in which shall be registered the names, addresses, and license numbers of all persons legally entitled to practice dentistry in this state. A majority of the members of said board shall at all times constitute a quorum for the transaction of business, and the proceedings of said board shall be recorded in a minute book open at all reasonable times to public inspection. The Secretary-Treasurer shall execute to the said board bond with approved security for the faithful performance of his duties.

### **Licenses and Registration and How Granted**

SEC. 3. No person shall practice dentistry in this state or attempt to do so after the passage of this Act without first applying for and obtaining a license for such purpose from the said Kentucky State Board of Dental Examiners, and registering such license as herein provided, and this provision applies to all persons whether they have heretofore practiced dentistry or not in this state, except such persons as have been heretofore licensed and registered. Application shall be made to the said board in writing for license and shall in every instance be accompanied by the examination fee of twenty dollars, which sum is authorized to be charged for each examination by said board. The applicant must be of good moral character, at least twenty-one years of age at the time of making the application, and the application of each person seeking a license must be accompanied by satisfactory evidence to said board that the applicant so applying is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university. Examinations must be both written and clinical, and of such a character as to thoroughly test the qualifications of the applicant to practice dentistry, and the board may, in its discretion, refuse to grant license to any person they find guilty of cheating, deception, or fraud during such examination.

### **Registering License with County Clerk**

SEC. 4. Every person licensed to practice dentistry in this state by the said Kentucky State Board of Dental Examiners, as herein provided, shall, before beginning the practice of dentistry, cause said license to be registered with the county clerk of the county or counties in which such person desires to engage in the practice of dentistry by appearing before such clerk and filing his affidavit, showing that he has been examined and licensed as herein provided, and the county clerk of each county is authorized to receive a registration fee of fifty cents for each registration.

### **Display of License and Certificate of Registration**

SEC. 5. The license to practice dentistry herein provided, and the certificate of registration shall at all times be displayed in a conspicuous place in his or her office wherein he or she shall practice the profession of dentistry, and he or she shall, whenever requested, exhibit such license to any of the members of the Board of Dental Examiners or its authorized agent.

### **Revocation of License**

SEC. 6. The State Board of Dental Examiners may refuse to issue licenses or suspend or revoke the same for any of the following causes:

1. The presentation to the board of any diploma, license or certificate illegally or fraudulently obtained, or one obtained from an institution which is not reputable, or an unrecognized or irregular institution or state board, or the practice of any fraud or deception.

2. The commission of a criminal operation or conviction of a felony involving moral turpitude, or chronic or persistent inebriety or addiction to drugs, or if the person holding such license shall advertise to practice dentistry without causing pain, or shall in any other manner advertise with a view of deceiving or defrauding the public, or advertise to use any drug, nostrum, patent or other proprietary drug or medicine of any unknown formula, or be guilty of any grossly unprofessional conduct likely to deceive or defraud the public, or which disqualifies the applicant to practice with safety to the people.

In all proceedings for a suspension or revocation of license, the holder thereof shall be given thirty days' notice to prepare for a hearing, and he shall be heard in person or by counsel or by both. The President and Secretary of the State Board of Dental Examiners shall have the power to administer oaths, in the hearing of all matters arising in the course of their duties, and in such trials as are herein referred to, the State Board of Dental Examiners may take oral or written proof for or against the complainant, as it may deem will best present the facts. In all cases of refusal to issue license, suspension or revocation, the applicant or holder may appeal to the Governor of the state within thirty days after such action by the State Board of Dental Examiners.

### **Failure to Register License**

SEC. 7. Any failure, neglect or refusal on the part of any person obtaining a license to practice dentistry from the State Board of Dental Examiners, to register said license with the county clerk of some county in this state within ninety days from the date of the issue of such license, shall work a forfeiture of such license, and no license when once forfeited shall be restored except upon payment to the said board of the sum of ten dollars for such neglect, failure or refusal to register such license.

### **Examination Fees and Compensation to Members of the Board**

SEC. 8. In order to provide the means for carrying out and enforcing the provisions of this act, the said board shall charge each person applying for an examination for a license to practice dentistry in this state an examination fee of twenty dollars, and in addition thereto, a fee of one dollar for every license or duplicate license issued by said board, and out of the funds coming into possession of the said board under the provisions of this act, the members of said board shall each receive as compensation the sum of five dollars for each day actually engaged in duties of the office, and all legitimate and necessary expenses incurred in attending the meetings of said board; provided that the Secretary of the board shall be allowed a reasonable salary to be fixed by the board and no per diem; all expenses shall be paid from the fees, fines and penalties received and recovered by the board, under the provisions of this act; provided that no part of said expenses shall be paid out of the State Treasury. All moneys received in excess of said per diem allowances and other expenses, herein provided, shall be held by the Secretary-Treasurer of said board as a special fund for meeting the other expenses of said board, and for such use as the said board may deem necessary in the enforcement of this act, and said board shall make an annual report of its proceedings to the Governor on or before the 31st day of December each year, showing all moneys received and disbursed by it pursuant to this act.



### **Renewal Certificates of License**

SEC. 9. On or before the 31st day of December each year, every dentist legally licensed to practice dentistry in this state shall transmit to the Secretary of the said Board of Dental Examiners his signature and address, together with the fee of one dollar, and the number of his or her registration certificate, and receive therefor a renewal license certificate. Any license granted by said board shall be cancelled and annulled if the holder thereof fails to secure the renewal certificate herein provided for within a period of three months after December 31. of each year, provided any license thus cancelled may be restored by the board upon the payment of a fee of five dollars if paid within one year after such cancellation.

### **Penalty for Fraud in Obtaining Certificate of Registration**

SEC. 10. Any person filing or attempting to file as his own the diploma or license of another, or a forged affidavit of identification or qualification, shall be deemed guilty of a felony and be punishable, upon conviction, by imprisonment in the penitentiary of not less than one nor more than five years.

### **Dentistry Defined**

SEC. 11. Any person shall be regarded as practicing dentistry, within the meaning of this act, who shall diagnose or profess to diagnose, or treat or profess to treat, any of the diseases or lesions of the oral cavity, teeth, gums, maxillary bones, or extract teeth, or shall prepare or fill cavities in human teeth, correct malposition of teeth or jaws, or supply artificial teeth as substitutes for natural teeth, or administer anesthetics, general or local, or any other practice included in the curricula of recognized dental colleges. Provided, That nothing in this act shall be so construed as to prevent regularly licensed physicians and surgeons from extracting teeth or treating any diseases coming within the province of the practice of medicine.

### **Exemption from Jury Service**

SEC. 12. All dentists of this state shall be exempt from service as jurors in any of the courts of this state.

### **Signatures, Seal, etc., on License**

SEC. 13. All licenses issued by said board shall bear a serial number, the full name of the applicant, the date of the issue, the seal of the board, and be signed by a majority of the members and attested by its President and Secretary.

### **Unlawful to Practice Under Name of a Company**

SEC. 14. It shall be unlawful for any person or persons to practice or offer to practice dentistry or dental surgery under the name of any company, association, or corporation, except those who have been in actual business for fifteen years or more prior to the 19th day of March, 1908, and every person or persons practicing or offering to practice dentistry or dental surgery shall practice under his or her own respective name or names only.

### **Dental Reciprocity**

SEC. 15. Said board may, in its discretion, issue a license to practice dentistry without examination other than clinical to a legal and ethical practitioner of dentistry who removes to Kentucky from another state or territory of the United States, whose standard of requirement is equal to that of Kentucky, and in which he or she conducted a legal and ethical practice of dentistry for at least five years immediately preceding his or her removal, provided such applicant shall present a certificate from the dental board or a like board of the state or territory from which he or she removes, certifying that he or she is a legal, competent and ethical dentist, and of good moral character; and provided further, That such certificate is presented to the Kentucky State Board of Dental Examiners within six months from the date of its issue, and that the board of such other state or territory shall permit in like manner by law the recognition of licenses issued by the Kentucky State Board of Dental Examiners when presented to such other board by legal practitioners of dentistry from this state who may wish to remove to or practice in such other state or territory.

### **Reciprocity Leaving State**

SEC. 16. Any one who is a legal, ethical and competent practitioner of dentistry in the state of Kentucky, and of good moral character, and known to the Board of Dental Examiners as such, who shall desire to change his or her residence to another state or territory, or foreign country, shall upon application to the said Board of Dental Examiners of this state, receive a special certificate over the signature of the president and secretary of said board and bearing its seal, which shall attest the facts above

mentioned in Section 15 and give the data upon which he or she was registered and licensed.

### Reciprocity Fees

SEC. 17. The fee for issuing a license to a legal practitioner from another state, as provided in Section 15, shall be twenty-five dollars, and the fee for issuing a certificate to the legal practitioner in this state as provided in Section 16, shall be five dollars, and in each case the fee shall be paid in cash before the license or certificate respectively shall be issued.

### Penalty for Practicing Without License or Certificate

SEC. 18. Any person who shall practice or attempt to practice dentistry in this state without having been licensed and registered for that purpose, as herein provided, or who shall violate any of the provisions of this act, for which no specific penalty has been provided herein, shall be subject to a fine of not less than five dollars nor more than twenty dollars for each offense, and each act of dentistry shall be deemed a separate offense and constitute a practicing of dentistry within the meaning of this act, and each day that a person shall hold himself out as practicing in any name except his own shall be deemed a separate offense. The opening of an office for the purpose of practicing dentistry, or to announce to the public in any way a readiness to do any act defined herein as being dentistry, shall be deemed to engage in the practice of dentistry within the meaning of this act.

### Disposition of Fines and Fees

SEC. 19. All fees, as well as all fines, imposed and collected under the provisions of this act shall be paid to the Secretary-Treasurer of the Kentucky State Board of Dental Examiners for the use of said board.

### Druggists May Fill Dentists' Prescriptions

SEC. 20. Legally licensed druggists of this state may fill prescriptions of legally licensed dentists of this state for any drug necessary to the practice of dentistry.

SEC. 21. This Act shall not prevent students from performing dental operations under the supervision of competent instructors within the dental school, college or dental department of a university recognized by the Kentucky State Board of Dental Examiners.

### Repealing Former Dental Laws

SEC. 22. All laws or parts of laws in conflict with this act are hereby repealed.

### Oral Hygiene in Toronto

Dr. C. N. Johnson addressed the teachers, trustees and their friends of the Separate School Board of the City of Toronto, April 26th, on the subject of Oral Hygiene.

Dr. Johnson's lecture was given under the auspices of the Separate School Board, but the Canadian Oral Prophylactic Association paid all the expenses, the same as they did when Dr. Dowd was brought to Toronto to lecture to the teachers of the Public Schools. Following Dr. Dowd's lecture the public schools inaugurated dental inspection of the public school children.

It is hoped that the Separate School Board will take a similar step at this time.

In the evening Dr. Johnson addressed the members of the Toronto Dental Society and their friends on the same subject as the afternoon lecture. At the close of the meeting there were many expressions of appreciation of the lecture.—*Dominion Dental Journal*.

**The worry cow would have lived till now**

**If she'd only saved her breath;**

**But she feared the hay wouldn't last all day,**

**So she choked herself to death.**

# OBITUARY

Dr. Charles H. Bartlett died of apoplexy at his home in Parkersburg, W. Va., May 4, 1912, at the age of 77 years.

He was born at East Hampton, Mass., February 20, 1835; received his education in the public school at Hampton. After leaving the public schools he entered the dental office of his uncle, and it was here that he learned his profession. Being always diligent and energetic, he soon became very proficient in the work.

In 1856 he located, for the practice of his profession, in Dunkirk, N. Y., remaining there for one year. In 1857, having a desire to go West, he moved to Davenport, Iowa, where he practiced one year. He then moved to Wheeling, W. Va., in 1858, but remained there only a short time.

After leaving Wheeling he came to Parkersburg, February 2, 1859, where he was soon blessed with a large practice.

In recognition of his ability he was appointed, in 1897, by Gov. George W. Atkinson as a member of the State Examining Board and was elected as its first president. He was a member of the National Dental Society; a member of the West Virginia Dental Society, which society he had served as its president. Dr. Bartlett prepared many papers for the society which were always appreciated by its members. He was a charter member of the Parkersburg Dental Society.

He had a stroke of paralysis in 1893, which necessitated giving up his practice for one year. After regaining his health he resumed his practice until November, 1910, when he received the second stroke, which left him unable ever to resume his practice.

He was an active member of the Episcopal church. He was a member of Mt. Olivet Lodge No. 3, A. F. and A. M.; a member of Calvary Commandery No. 3, K. T.; a member of Osiris Temple, Mystic Shrine; and also a charter member of the Parkersburg Country Club.

In the death of Dr. Bartlett, Parkersburg loses one of her best known and most beloved citizens; one who had been closely identified with her re-



Dr. Charles H. Bartlett



ligious, business and professional life for fifty years. In public life Dr. Bartlett was the soul of honor, very easy to approach, and of a most companionable nature. In professional life he was conscientious, painstaking and very skilful. In home life a true husband, and a kind and loving father. He is survived by one son.

His funeral services were conducted by Mt. Olivet Lodge No. 3, A. F. and A. M., with Calvary Commandery No. 3 as escort.

### DE TREY'S SYNTHETIC CEMENT

By Dr. Raymond F. Moller, Havana, Cuba

(Translated from "Dental Revista," March, 1912.)

My short experimental work with de Trey's Translucent Synthetic Cement has convinced me of its inestimable value for the various uses I have made of it.

In the first place, a resemblance to the natural teeth is obtainable with completeness through the various shades or colors that are furnished. The resemblance is so exact that after it has been polished it is difficult to distinguish the union of the material with the walls of the cavity.

I have had a case in which, when the patient received the bill for my fee, he refused payment, alleging that he could not see even the smallest sign that a tooth had been filled.

This, of course, made me smile, but with satisfaction and pride. To convince my patient that I had not tried to defraud him, I had temporarily to destroy the translucency of the filling by drying it with a continuous current of compressed air. The filling could then readily be seen and the patient was convinced that in reality the work had been done.

I then made him wash his mouth, and as soon as the filling was moistened it was again lost to sight.

The duration of the Synthetic Cement and its resistance I have tested in the following cases:

Miss H., twenty years of age, central incisor with caries on its distal face, and a total loss of the cutting border, the cavity involving one-third of the total size of the tooth, leaving only the mesial face. All the cavity walls were reduced to enamel. The tooth was so much damaged that the patient requested me to give her a dowel crown similar to one which had been on the adjoining central incisor. After treating the root canal, I filled the upper third as much as possible so as to give greater strength to the Synthetic Cement filling. After applying the rubber dam, I selected shade No. 4 and made the mix of a rather thick consistency, packed the cement carefully but rapidly, using the agate spatula and burnisher to give the approximate form of the tooth. After ten minutes, I covered the filling with the wax furnished by the manufacturers, and removed the rubber dam, leaving the patient to rest for one hour and a half, in which time I attended to another patient.

That was Miss M. V., twelve years of age, for whom I had prepared a proximal cavity in the left superior molar. This cavity I filled in the same way with Synthetic Cement, except that I used a celluloid band as a matrix for restoring the proximal wall and building up the cusps to full occlusion. After covering the filling with the wax, I left it to dry and then gave attention to my former patient, Miss H. After removing the wax, I polished the incisor filling with Arkansas stone. When finished, the result was surprising. The filling had the same translucency as a live tooth.

Great was the surprise of the patient when I showed her, through the glass, the restored tooth, all finished, and that a porcelain crown had not been necessary.

Then I returned to the second patient and finished the molar restoration.

These cases are the first ones in which I employed Synthetic Cement. After the lapse of four months the fillings still remain perfect, and I believe will so continue.

I have also had occasion to make a lateral tooth in an upper plate of rubber, the tooth having broken at the pins. This tooth I restored with Synthetic Cement. This operation required only ten minutes. This was done two months ago and the work is still in good shape.

I have also used Synthetic Cement to form a face or veneer for a bicuspid facing in an upper bridge denture, utilizing the pins for retention. The result has been satisfactory. On the sixth of March, before the Dental Society of Havana, I had the honor to present a continuous gum set made with Synthetic Cement, over a base of gold; and had the satisfaction of receiving sincere congratulations, not only from the president but from each of the distinguished representatives present on that occasion.

# SOCIETY ANNOUNCEMENTS

## National Association of Dental Faculties

The National Association of Dental Faculties will meet at the New Willard Hotel, Washington, D. C., on Friday and Saturday, September 6th and 7th. The Executive Committee will meet at 9 o'clock Friday morning, the general meeting opening at 10 o'clock the same morning.

GEORGE EDWIN HUNT, *Secretary*.

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## National Dental Association

The 1912 session of the National Dental Association will be held in Washington, D. C., September 10th to 13th, and all indications are favorable for this being the most important and successful meeting that this association has ever held.

The Local Committee of Arrangements has selected the New Willard as "Headquarters Hotel" and necessary accommodations for the meetings of the general sessions and sections, as well as the "all-day clinic" on the last day, are to be held in the commodious ball room on the eleventh floor of this hotel. This provides the ideal arrangements for a successful meeting, that is, all under one roof.

The reorganization proposition has been receiving most liberal support from the State Societies, which have met since the Cleveland meeting, when a constitution, along the lines of the American Medical Association, was tentatively adopted. This question will come up at this meeting for final action and every one interested in the perfecting of a representative National Dental Association should be present. You are respectfully requested to remember this meeting when making your vacation arrangements, as this presents an excellent opportunity to attend the meeting of the National Dental Association and visit our National Capitol.

The details of the program are not complete, but the officers and committees have spared no effort in preparing same, and further information will appear in August and September journals.

ARTHUR R. MELENDY, *President*,

Deaderick Bldg., Knoxville, Tenn.

HOMER C. BROWN, *Recording Secretary*,

185 East State St., Columbus, Ohio.

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## The Northern Indiana Society

Is planning the best and most enjoyable convention in its history for Tuesday and Wednesday, September 3 and 4. The meeting is to be held at Sylvan Lake, Rome City, Ind.

Members are urged to reach Rome City on Saturday and remain over until the convention. Monday is Labor Day, so that no additional time from the office would be required.

The time is most opportune, and all indications point to a tremendously successful meeting. The program is not fully completed, but among the clinics one of the most important will be demonstrations of  $N_2O$  and  $O$  in analgesia, than which no subject is more important or attracting more attention at this time.

For further information address

ROBERT GILLIS, *Secretary*,

Hammond, Ind.

## To Members Ohio State Dental Society

The Education and Oral Hygiene Committee urges upon all members the importance of the lecture field, and wishes to remind all interested that the Society owns a fine stereopticon and set of slides, which it is more than willing to loan to all who are willing to give talks or lectures on mouth hygiene. Write the committee long enough in advance to allow arrangements to be made. Should the stereopticon and slides owned by the Society be in use when you want them, another lantern with outfit of slides, owned by THE DENTAL SUMMARY, is available and will be loaned free of charge. In writing the committee, always state the kind of electric current available, whether direct or alternating, and name first and second choice of dates.

E. M. MARTINDALE, Columbus

L. L. ZARBAUGH, Toledo

W. T. JACKMAN, Chairman, Cleveland.

*Committee.*

## The Indiana State

### Resolution Affecting Co-operation With the Reorganized National

WHEREAS, The National Dental Association has expressed the wish of the State Society delegates, at its last annual meeting, and has passed a resolution tentatively adopting a constitution that will reorganize itself along the lines of the American Medical Association, and

WHEREAS, This will provide for State and Territorial Dental Societies being constituent members thereof and entitled to a proportionate representation in the House of Delegates, and

WHEREAS, The Indiana State Dental Association recognizes the necessity for a larger and more efficient National organization; therefore be it

*Resolved*, That on this 21st day of May, 1912, the Indiana State Dental Association, in its regular session, heartily endorses the plan adopted by the National Dental Association to reorganize, and hereby express a desire to become affiliated, and pledges 50 per cent of its membership for a period of two years from the adoption of the new constitution by the National Dental Association. This resolution not to be binding if the dues exceed \$2.00 per member.

Passed by unanimous vote of the Association.

### Resolution Passed by Board of Trustees

WHEREAS, The Indiana State Dental Association sent a representative to a conference held in Cleveland, Ohio, July 25, 1911, to co-operate with similar representatives invited from all state dental organizations, with a view of formulating plans for perfecting a more representative National Dental Association, and

WHEREAS, Twenty-three of the twenty-four representatives in attendance voted in favor of reorganizing the National Dental Association along similar lines to those of the American Medical Association, and

WHEREAS, Our State Dental Association voted unanimously May 21, 1912, to become affiliated with the National Dental Association in accordance with the constitution tentatively adopted last year at Cleveland; therefore, be it

*Resolved*, That the Board of Trustees of the Indiana State Dental Association does not look with favor upon the resolution passed by the Illinois State Dental Society and fears that further conferences with representatives from different States will only tend to cause confusion and interfere with the present plans, which seem to be receiving most liberal support from a large majority of the State Societies which have met since the 1911 National meeting.

Unanimous vote and all were present.



# NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

## THE TAGGART - BOYNTON CASE

### St. Louis Dentists Discuss an Interesting Situation—The Meaning of the Suit.

"The Crouse-Taggart agreement and other patent issues in their relation to the dental profession" were discussed at a mass meeting of dentists held at the Southern Hotel, St. Louis, the evening of April 13th. The call was issued by fifteen representative dentists, and the meeting was largely attended. The chairman of the meeting, Dr. S. H. Voyles, made the opening talk, explaining the intent of the Lodge bill and the present status of the litigation over the patent of Dr. W. H. Taggart. In explaining these matters the speaker, a trustee of the National Dental Protective Association, read paragraphs from the article of Dr. Emory A. Bryant, a prominent dentist and patent attorney of Washington, D. C., published in the April number of *The Dental Brief*.

Dr. Bryant, as chairman of the Committee on Patent Legislation of the National Dental Association, was instrumental in proposing and introducing the Lodge-Webb bill, which seeks the cooperation of all organized dental societies in influencing their representatives to aid the passage of these bills.

A similar bill failed of passage some years ago and Dr. Bryant speaks of the possibility of its passage at this time, saying: "If Congress breaks into the patent system with one restriction, it goes without saying that every other interest affected adversely by patents will besiege Congress for like restrictions for their benefit. It will be seen at once that it is a very serious question and will demand very serious consideration." However, all aid possible should be given in ridding the profession from future taxes on manipulative skill and permit us to give to our patients that highest service that we are legally and morally bound to do.

A resolution introduced by Dr. E. P. Dameron, asking all of Missouri's representatives in Congress to give their active support to the passage of the Lodge-Webb bills and to oppose the passage of the Cullom bill, attempting to secure the reissue of the Law patent. This resolution was unanimously voted and will be forwarded to our representatives and senators.

Dr. Bryant's article was again quoted as follows: "It is therefore obvious, that so far as the Supreme Court of the United States is concerned, it has only validated those process patents that '*involve chemical or other similar elemental action, or mechanical action.*'" That being the case, it is still an open question if process patents which do not involve either of the above elements are patentable at all under the laws of the United States, and although, under the present law, patent cases cannot be appealed from the Court of Appeals "of right" to the Supreme Court of the United States if this defense is called to the attention of the Court of Appeals when the Taggart-Boynton case comes before it, that at once involves a constitutional question, and the Supreme Court would, without a doubt, allow it to come before that body for final adjudication on that ground by a "writ of certiorari" and be final in its results. This is an ideal case for the final determination of the very remedy which we have proposed to Congress through the method of legislation, and without doubt would be finally determined before we would be able to accomplish the legislation we are striving for, with the additional proposition, that if the Supreme Court decided, as we have reason to think it would do, that the whole matter of process patents, including that of Dr. Taggart, for a "method of making moulds for dental inlays and the like" would be disposed of, as well as any restrictions upon the use of the said process. If the process Dr. Taggart has evolved is patentable under the laws of the United States, I for one am willing to bow down and accept the inevitable with every grace possible; but if it is not, then, in whatever capacity I may be serving, I shall resist to the best of my ability. It is then possible to combat process patents in two ways. First, to attempt by legislation such as the Lodge-Webb bills, to prohibit future granting of such patents. Second, to carry the Taggart case to the Supreme Court on the Constitutional question and seek to get a decision which will stop the Taggart process patent and also inhibit the patent office from granting similar ones in the future. The National Dental Protective Association asks the support of the profession in attempting these two things."

# THE DENTAL SUMMARY

The Magazine That Helps

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AUGUST, 1912

No. 8

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The Indiana State Dental Society  
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## REGULAR CONTRIBUTIONS

### THE USE OF SPLINTS IN THE TREATMENT OF PYORRHEA\*

By W. F. Spies, D.D.S., New York City

**B**Y THE TIMELY use of properly constructed splints, it is frequently possible to overcome the irritation of peridental tissues occasioned by excessive tooth-movement and to provide that degree of rest which is absolutely essential to reparative processes. In many instances, splints also enable us to save teeth that could not otherwise be retained; and since the loss of a tooth invariably disturbs the symmetrical relationship of those remaining, it is manifest that resort to such appliances is often needful.

It is also well to remember that very loose teeth can often be splinted in such manner that they serve as satisfactory abutments for bridges or as supports for partial dentures. The possibilities of such splinting of loose teeth should always be taken into consideration before extractions are de-

\*Paper read at the meeting of the Fourth District Dental Society of New York.

cided on, lest it be subsequently discovered that no substitute can be made to give satisfactory service.

In the treatment of pyorrhea, the aim should always be to remove its underlying cause, arrest destruction of tissue, aid reparative processes and prevent, whenever possible, the loss of a tooth.

In order that we may better understand why a tooth does become loose

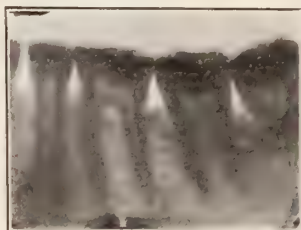
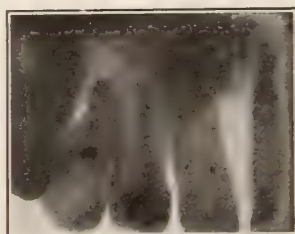


Illustration No. 1. In this radiograph it will be seen that the supporting bony structure between the first and second molars surrounds the tooth nearly up to the enamel line. The tooth is held firmly in place by the periodental membrane, which is attached to the root on one side and to the bony, or alveolar, wall on the other. The contact of the crowns of the teeth will also be noted, and this plays no small part in the retention of the teeth.

and such appliances as splints are frequently necessary, the normal anatomical arrangements for the retention of dentures should be briefly reviewed.

Teeth may become loose as a result of inflammation of the periodental membrane, the loss of supporting bony tissue, and the relaxation of the surrounding soft tissues.



Illustrations 2 and 3 show extensive destruction of bony support about the roots of the teeth.

If, as is often the case, a tooth has become loose in consequence of an inflammatory state of the periodental membrane, the use of splints will seldom be necessary: for the underlying condition can be easily eradicated by appropriate local treatment. The toxic products which issue from a dead pulp act as an irritant to the periodental membrane, and, as such, frequently give rise to inflammation, which causes more or less extrusion of the root from its socket and gives the denture the appearance of being too long.

When, however, there has been an extensive destruction of the bony tissues, the employment of such appliances as permanent splints may be absolutely essential to the retention of the involved teeth. By the proper attachment of splints, it is frequently possible to institute a successful



course of treatment, and escape the necessity of introducing artificial dentures.

Since it is an indisputable fact that artificial teeth cannot fully perform the functions of natural ones, and since a change of facial expression, due to the absorption of bone, generally follows extractions, it is clear that there are cogent reasons, both physiological and esthetic, why such appliances as temporary or permanent splints should be used.

In making splints, it is always necessary to observe the principles of



Illustration No. 4. Looking down on the lower anterior teeth, showing how wires are placed for making temporary splints.

architectonics; in other words, the structural arrangement of an appliance should be such that it will afford the maximum amount of support at the minimum amount of attachment-stress. It is also important that splints be so constructed that they will not form points of attachment for oral filth. They should be highly polished and placed as near as possible to the incisal and occlusal surfaces. Wherever it is possible, all pockets and extensions that might serve as resting places for food-remains should be avoided.

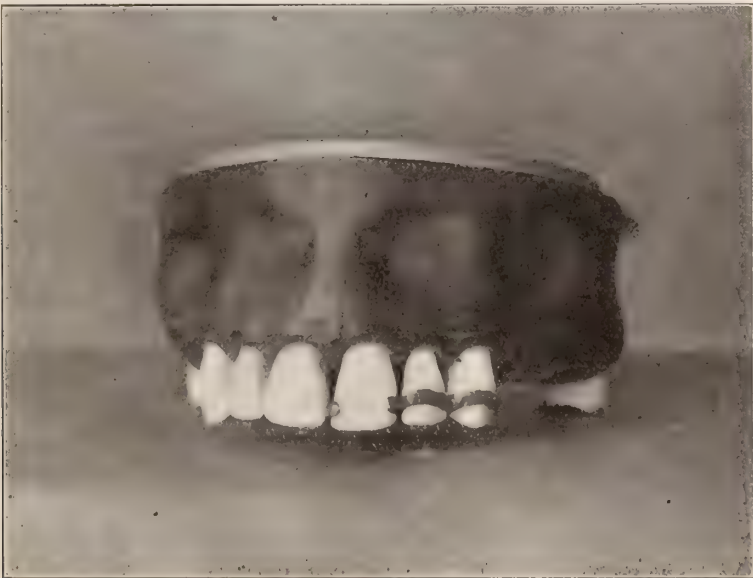


Illustration No. 5. Section of splint made of a series of bands. Front of one band cut away, as seen on upper central, in this manner making a gold button which holds the tooth rigid.

In the construction and attachment of splints, it is well to remember that a great deal depends on the proper articulation and occlusion of the teeth. If the teeth strike too hard, this fault should be corrected. When it is necessary to restore the occlusal surface, care should be exercised in the arrangement of the cusps in relation to the antagonizing teeth. This arrangement should provide for correct position of the teeth when in occlusion and also in their articulation. When the teeth are separated, the interproximal tissue is exposed, and, consequently, frequently irritated. Whenever possible, lost contact of the dentures should be restored, for this will tend to safeguard the health of the interproximal tissue.

If the teeth are extremely loose, they should first be placed in a position of rest. This will facilitate the removal of deposits from the roots.

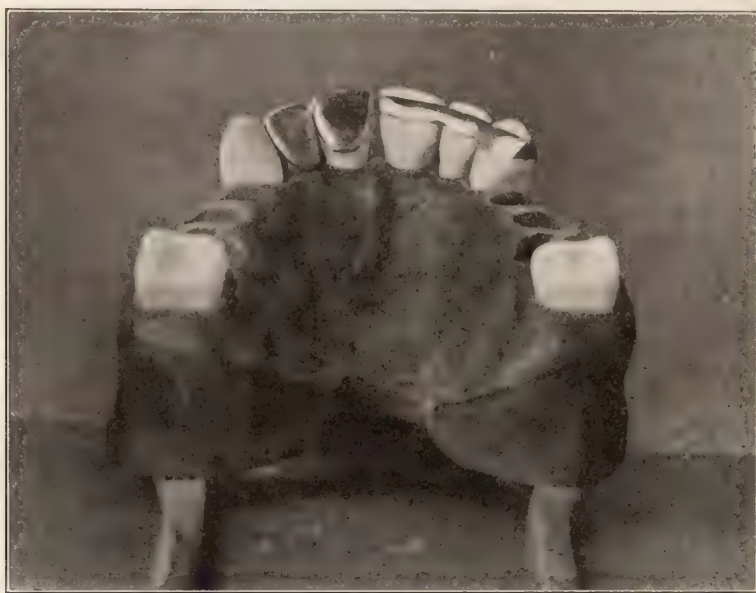


Illustration No. 6. The lingual side of a section of splint shown in No. 5 is here shown on three teeth. Another form of retainer is shown on the other central and lateral. Pins are set into the crowns of the tooth as shown in Illustration No. 7. Backings are cast or burnished as shown on these teeth. They should then be soldered together at the cutting edges, maintaining the interproximal space.

add to the comfort of the patient and greatly benefit the periodontal soft tissues.

In making attachments of splints, the method employed must, of course, be determined by the condition of the individual case. It is well-known that a line of procedure that would prove entirely satisfactory in some mouths might fail completely in others. This is particularly true with regard to the methods used in inlays, cutting into the teeth and making flush joints, or the outside method by making use of iridio-platinum pins.

Splints are used in pyorrhea to (1) relieve stress, (2) restore dentures to their appropriate anatomical positions, (3) afford support, (4) arrest

inordinate tooth-movement, (5) facilitate mastication, or (6) impart rest to the periodental structures. From this it can be readily seen that the structural arrangement of a splint must vary according to the purpose it is to serve.

The form of splints required in any given case of pyorrhea will, of course, be *temporary* or *permanent*, according to the extent of the impairment or destruction of periodental structures. *Temporary* splints are most serviceable in instances where the soft tissues need rest during repair or support during instrumentation; whereas *permanent* splints are required when the destruction of bony tissue has deprived dentures of the necessary amount of mechanical support.



Illustration No. 7. The lingual side of a tooth prepared for the adaptation of a backing, as shown in Illustration No. 6.

There are many ways in which a temporary splint can be made, either by the use of thread or wire. Illustration No. 4 shows a form of temporary wire splint which need not be changed, is clean, and if properly applied does not draw the teeth together as does the thread. It is made by using 26-gauge gold ligature wire for the slip-noose and 30-gauge for the wires between the teeth. Make a slip-noose over the teeth to be enclosed, by bringing one end of the wire over the other, but not twisting them together. Cut short pieces of wire to be used between each two teeth, twist the ends together and draw tight. These wires should be cut to such length that the ends may be turned back into the interproximal space without touching the gum tissues. The ends of wire of the slip-noose should now be twisted together.

Platinum wire 26-gauge can be substituted for the gold ligature wire. The platinum wire admits of burnishing and better adaptation to the tooth.



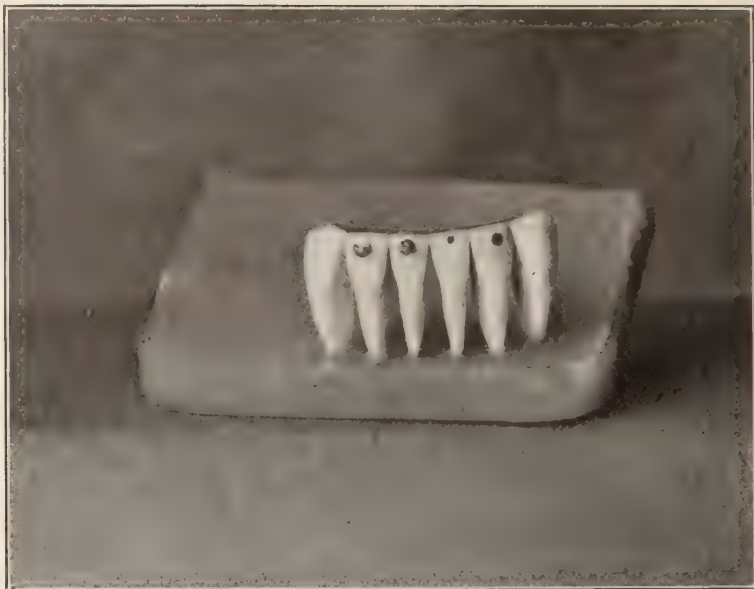


Illustration No. 8. Permanent splint holding four lower incisors. Attachments to cuspids may be made by devitalizing these teeth and putting posts down, or by inlays, or by putting bolts through from labial to lingual. The cast piece shown in Illustration No. 9 is put on the lingual side of the teeth and bolts put through, as shown on the incisors. Gold nuts shown unfinished on right central and lateral; the bolt hole shown on left central. Gold nut finished down in left lateral.



Illustration No. 9. Lingual side of permanent splint partly shown in No. 8. This shows the cast piece on the lingual and the T heads of bolts.



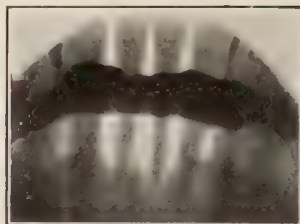
Illustration No. 10. Occlusion and articulation restored by means of a crown or inlay on lower second molar and a dummy in place of the first molar. This prevents elongation of the upper teeth and tipping of the lower, and gives the tissues supporting these teeth their normal amount of work. The occlusal view of the piece and the form of attachment to the bicuspid are shown in Illustration No. 11.



Illustration No. 11. Occlusal view of piece shown in Illustration No. 10. An inlay was made to fit the bicuspid. A cavity is formed in the inlay, either to be retentive in form to receive a similarly shaped lug from the dummy, or merely to afford rest for such a lug. The use of the second inlay in the tooth is to permit good adaptation and avoid caries.



No. 12



No. 13

Illustration No. 12. Radiograph showing loss of first molar and destruction of process about second molar as a result of malocclusion.

Illustration No. 13. Nearly all of the supporting bony tissue about the centrals has been destroyed. A temporary splint of wire was attached. Impression in plaster was secured and model made of low-fusing metal. A wax model made of lingual and labial sections. These were invested and cast in gold. The castings placed upon model, holes drilled through them between lateral and cuspid on both sides. A piece of 20-gauge iridio-platinum wire of sufficient length to extend through lingual and labial piece was used and soldered to lingual piece, and then threaded. The labial piece was countersunk to take a gold nut. This form of splint is removable.



Illustration No. 14. The illustration shows part of a permanent splint which extends from the second bicuspid on the right side to the first molar on the left side. A firm attachment was secured in the bicuspid and molar by use of inlays with pins. V-shaped spaces were cut between all of the anterior teeth near the incisal edge to allow for sufficient metal for strength. Impression taken and model made of Price's artificial stone. Casting made directly on model. The gold buttons will be noted in illustration showing as white spots between the teeth. The gold buttons prevent the rotation of the teeth and hold them securely.



## CASE OF ACUTE MERCURIAL POISONING FOLLOWED BY GENERAL NECROSIS OF MAXILLARY BONES AND PURULENT OTITIS MEDIA.\*

By M. Herzstein, M.D., and A. Baer, D.D.S., M.D., San Francisco

On December 3, 1910, Mrs. E., aged 28, drank a solution containing six  $7\frac{1}{2}$ -grain tablets of mercuric chloride. She vomited freely within five minutes; her stomach was washed at the end of thirty minutes, and in the interim she drank the whites of half a dozen eggs and two glasses of sweet oil. At the end of an hour she became unconscious and was removed to the hospital. Urine, drawn by catheter for the first time at the end of sixty-two hours, was bloody, four ounces in all. Patient was unable to take nourishment except by rectum, as everything taken by mouth was immediately expelled by vomiting.

A diffuse papular rash appeared over the entire surface of the body at the end of twenty-four hours; the left heart was dilated and sounds were weak; pulse, 120, weak, thready and of low tension; liver enlarged to about three fingers' breadth beneath the free margin of the ribs; examination of urine showed presence of albumin (0.3 per cent), large quantity of pus, large numbers of hyalin and granular casts and renal epithelium. The patient's ankles, knees, hips and elbows became sore and stiff, and by Jan. 1, 1911, she had lost thirty-five pounds.

By the second day her teeth had turned black, and were extremely loose, while from the sockets there exuded a free discharge of foul-smelling pus. Breath was intensely offensive; the saliva fairly ran from her mouth in a stream. She could only open her mouth about three-fourths of an inch and was unable to close it because of the extreme soreness of her mouth and teeth.

The entire oral mucous membrane, but especially that over the alveolar processes, was covered by a mass of large vesicles, which on bursting discharged a thick hematoserous fluid. As the condition (i. e., mercurial stomatitis) progressed, small areas of necrosed bone were exposed and showed over the entire alveolar process, first appearing in the regions between the teeth themselves, and then spreading laterally in all directions. The teeth finally became so loose that, during the first month eight lower teeth, the right bicuspid and molars and the left bicuspid and first molar, and four upper teeth, the right and left second bicuspid and first molars, either dropped out or were taken out by the patient herself, through fear of swallowing them. The remaining teeth, although also very loose at this time, subsequently tightened in their sockets and at the present time are firm and normal. A large abscess mass formed externally on the left side beneath the bicuspid, and was opened and drained into the mouth.

Coincident with the development of this condition in the mouth, there occurred an acute purulent otitis media, with an associated intense pain over the mastoid region and back up over the neck and head. The eardrum ruptured in the upper posterior quadrant and there was a free discharge of pus. There was complete loss of hearing on the left side.

By January 1, 1911, the alveolar processes of the upper and lower jaws had necrosed and were completely denuded of gum tissue on their articulating surface.

Patient was operated on February 1, 1911, and eighteen sequestra were removed from the exposed alveolar processes and from between the necks of the teeth which had not been lost. The largest pieces removed measured  $1\frac{3}{4}$  and  $\frac{3}{4}$  inches in length. At this time the abscess mass beneath the left maxilla, having continued to increase in spite of being drained into the mouth, was opened externally on the face, and was

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\*Read in the Section of Stomatology (A.M.A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Jour. Amer. Med. Association*.

drained daily by means of through and through irrigations and kept open by means of a rubber tube and gauze packs. With the exception of this one area, the mouth had entirely healed by February 15. This sinus continued to discharge about one dram of pus with each daily irrigation, being reduced to but a few drops at the end of two months, i. e., April 15. At this time a large sequestrum was removed through the external face incision and by May 1 the patient's mouth was entirely clean and healthy.

The condition in the ear was successfully treated by Dr. W. S. Franklin without operation. Discharge has entirely stopped and the patient's hearing on the left side has been restored to about one-third normal.

By means of tonics and an out door life she has regained about twenty pounds, but still suffers from extreme anemia, due to a very weak heart. She also has a chronic parenchymatous nephritis.

This case is simply an aggravated form of a condition which is seen in the mouth during the normal administration of mercury, as it is given in the treatment of syphilis, or which quite frequently results from an overdose of calomel. The fact that mercury is, to a very large extent, excreted through the mucous membrane of the mouth, probably accounts for the peculiar susceptibility of the oral tissue to overdoses of this drug. In ordinary salivation we get the beginning of a mercurial stomatitis and a mercurial necrosis of the alveolar processes, which accounts for the gradual destruction of the bone around the teeth and which, if allowed to continue, would ultimately result in the loss of the teeth owing to the complete softening of the alveolar processes supporting them, and the cementum of the teeth, which is typical bony tissue, histologically, takes part in the same destructive process and hastens the tendency toward tooth exfoliation.

There are a great many cases on record in which this latter condition has occurred, but I am unable to find any in which such extensive destruction as took place in the present case has been reported. The unique character of the case is perhaps due to the fact that the condition usually ends fatally, and it is only by the rarest good fortune that this patient's recovery, owing to prompt medical attention and to her own remarkable vitality and resistance, has enabled us to witness and to treat the interesting condition which we are able to report in this paper.

177 Post Street.

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## AMALGAM METHODS OF MAKING GOLD INLAYS\*

By E. A. Honey, D.D.S., Kalamazoo, Mich.

This clinic was shown first in Michigan by Dr. Spalding in Ann Arbor, in March, and again at the last state meeting at Grand Rapids.

The clinic consists in the making of gold inlays by taking impressions and making amalgam models of the teeth, so that the wax model of your inlay would be carved and your inlay made out of the mouth. After the cavity preparation is complete, an impression is taken in modeling compound, from which is secured an amalgam model, showing accurately all margins of your cavity. From this the wax model of your inlay is carved and cast in the usual way, returned to the amalgam model for burnishing, when it is ready to insert in the mouth.

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\*Clinic at Southwestern Michigan Dental Society.

## EASY AND CORRECT METHOD OF OBTAINING IMPRESSIONS, AND CONSTRUCTING LOWER PARTIAL PLATES\*

By Dr. C. H. Chapman, Webster Springs, W. Va.

Take a 25 S. S. White lower impression tray; cut one-half inch off the distal end, and cut away the anterior front. Now replace the anterior front with wax. Put in an excess of plaster for success. Now remove the wax from the anterior part and disengage the anterior surface of the lower front teeth and also superfluous pieces of plaster. Now remove impression. Now take 16-gauge platenoid; bend ends at right angles so as to come on the distal surface. Now attach 16-gauge gold clasps; arrange teeth in usual method. Invest so as to leave the clasps and ends of wire free. Now pour top so as to engage them; open and pack. Now, with wire cutter, remove the ends of the wire. Finish and place plate in mouth. Then adjust the clasps. Be sure to lift plate high on the distal surface of the teeth.

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\*Clinic at West Virginia State Dental Society.

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## PYORRHEA CLINIC\*

By Dr. J. P. Carmichael, Milwaukee, Wis.

It is my desire to demonstrate in this clinic today, that it is not only possible to remove all the diseased tissue, but I propose to smooth the exposed surfaces of the tooth, from the very border of the healthy tissue to and including the entire crown.

It makes no difference what your methods of practice may be, I think it will be conceded by all, that this diseased tissue must be removed, and secondly, the surface of the teeth must be so smooth and polished that they will ward off all foreign substances. When the root surface is properly finished the gum again tightens about the root and shows a rapid recovery to health.

I have divided my clinic into three essential steps—instrumentation, taping and polishing. The instruments I use are of a drawplane pattern, with which I am able to operate with little or no injury to the gum, and at the same time remove not only the deposits but the diseased periodontal membrane from the surface of the roots to the very border of healthy tissue, and with these instruments, properly handled, the work can be done without scratching the root surfaces. The taping is done mostly with the fine cuttle-fish strips, which do not scratch as much as fine sandpaper; I draw the tape entirely around the root and, working it down beneath the gum, I succeed in smoothing the roots as far as I have gone with the instru-

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\*Clinic Southwestern Michigan Dental Society.



ments. For the final finish I use a broad floss tape, which I charge with Carmi-Lustro for a polisher; this is best done by mixing a small quantity of the powder with a little alcohol; the alcohol reduces the powder to a creamy consistency, which can be spread over the entire surface of the tape and is then allowed to dry. With a napkin I remove all moisture from the teeth and gums and carry my tape entirely around the tooth and draw it back and forth until a smooth, glistening surface is produced.

If this procedure is properly carried out, there is a wonderful and rapid recovery of the gums. A full recovery of the gum tissue will be noticed in from two to three days, in fact there will be no further discharge of pus whatever. I use no medical treatment, only a soothing, healing application. The gums usually feel very much improved after the operation. However, a few hours later, in certain instances, there may be some ache and pain in the gums, which can usually be relieved by the patient holding hot water, containing a small quantity of some good mouth wash, in the mouth; this application should be kept up some ten to twenty minutes, to be beneficial. At the end of three days you may expect to find a well-healed and firm gum, that will permit brushing and even taping with the silk, without hurting the gum.

In treating the crowns of the teeth I, of course, remove any stain, but in doing so I avoid the use of all harsh substances, except where it is necessary to polish out the corroded spots; I wish to produce the smoothest possible surface, thereby the chance of adherence of foreign substances is minimized, and the teeth are left again nearer the original state of Nature. The luster results from the smoothness. I secure the final results simply by the application of Carmi-Lustro, which I have mentioned in connection with the taping and which is applied by the ordinary methods of buffing.

Since giving the above reported clinic, I have met Dr. W. F. Dunlop of Spokane, Wash., who demonstrated his method of Pyorrhea treatment at a private clinic during the week of the Chicago meeting in February, and at my office in Milwaukee the following week. He has developed a method of treatment whereby the uninjured peridental membrane may be restored to healthful conditions.

His treatments are made by volatilizing an antiseptic under about twenty pounds' pressure of "Dunlop's Compound Gas," made by Lennox of Cleveland, Ohio, under Dr. Dunlop's formula, which is given off in the form of Ethyl Borate Dry Vapor, which seems to penetrate the interstices of diseased tissue, neutralizing pus and stimulating healthy action.

The process is a notable innovation in surgery. He has developed its use for dental surgery by certain means of application. The responses are quick and the results are most promising of permanent cure.

I take the present occasion to call attention of the profession to Dr. Dunlop's discoveries, which appear to involve a new fundamental principle in the treatment and cure of diseases.

## THE PRACTICE OF DENTISTRY\*

By H. B. Tileston, D.D.S., Louisville, Ky.

**I** MUST TELL you first how much I appreciate the compliment you have paid me by inviting me to meet with the Northeastern Kentucky Dental Society and read a paper. I assure you it gives me great pleasure to be here and to take part in one of your regular meetings.

I have chosen the general topic of "The Practice of Dentistry," not with the purpose, however, of presenting a treatise upon so broad a subject nor of taking up the consideration of any special methods of practice.

I am prompted to give expression to a few thoughts suggested by some articles I have read and some remarks I have heard from dentists which seemed to me to belittle our profession; things which had a decidedly pessimistic tone and were not calculated to foster that pride in and love for a truly noble calling, which should possess the minds and hearts of all engaged in its practice.

Imagine the effect upon young men just entering the profession of reading an article ascribing to the dentist every unfortunate thing that could befall a man—hard work, poor pay, poverty, social debasement and an old age without a competence, and closing with a jingling rhyme asking who must endure this hardship and that misfortune, and ending each verse with the answer, "the dentist." Or of having men who have been long in practice say that if they had it to do over again they would never choose dentistry as their profession or permit a son of their's to enter it if they could help it.

We have all read such articles and heard such remarks as these, and while there may have been some justification for them in the experiences of these particular individuals, it is unfortunate that such sentiments should find public expression to poison the minds of young practitioners with the idea that they had made a most grievous mistake in choosing their profession.

For this reason I am moved to espouse the other phase of this matter, to turn to the brighter and truer view, and depicting things, not as they should be but as they actually are, paint a rosier picture and give a more cheering outlook than some of us may have had before.

## WHAT HAS BEEN DONE IN THE PAST

To the thoughtful man, a glance at the history of dentistry must make his heart swell with pride. Not so much its ancient history, for that is so meager and fragmentary that if there were any marked achievements previous to the last century to signalize the art as of much importance to the welfare of mankind, we have no record of it. True, there have been brought to light some specimens of dental prosthesis showing that crude attempts

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\*Read before the Northeastern Kentucky Dental Society at Covington, Ky.

were made by the ancient Greeks, Egyptians and Etruscans to mitigate in a measure the misfortune of the loss of some of the natural teeth. But aside from the satisfaction of knowing that dentistry had a beginning in such remote times, nothing has come down to us from that period that is of any value. Surely the people of those ancient times did not stand as much in need of the ministrations of the dentist as do the people of today. Necessity was as much the mother of invention then as now, and if human teeth were as subject to destructive diseases in those days as they are in these and had no remedial care, the *genus homo* would by now, by the process of evolution, have become practically an edentulous animal.

It is the accomplishments in the last seventy-five years, and especially in the last twenty-five, the truly wonderful things that are being done right now and the confident prediction of still greater things in the immediate future that give us cause to congratulate ourselves that we are members of one of the most remarkable professions of modern times.

Just consider for a few moments what dentists are doing at this time for their fellowmen, and compare their services now with that of only a few years ago, and with the actual, tangible benefits conferred by any other calling or profession. Throughout almost the entire span of the nineteenth century the work undertaken by dentistry was exceedingly limited as we view it now in the light of present day achievements, although much pioneer work and work which was of value as a preparation for that which was to follow, was done and well done.

Dentistry was practiced in the early colonial times and some noble men were associated with it even then, but few if any devoted their entire time to it. Their activities were chiefly directed to the extraction of teeth and their replacement with the crudest of substitutes. The first great advance came when porcelain teeth were introduced, especially after Samuel S. White began their manufacture in this country. The real province of the dentist, namely, to save teeth, received its first impetus with the establishment of the first dental college in 1839, where men were taught how to preserve the teeth, and dentistry became then a distinct profession. With the limited means at their command, hand instruments and non-cohesive gold foil and occasionally the much despised amalgam, a material excluded entirely from the practice of the best operators, it necessarily followed that efforts towards conservation were confined to teeth but slightly affected by caries. Teeth with badly broken-down crowns, those with exposed and aching pulps, and pulpless or abscessed teeth were alike condemned to the forceps.

The discovery of the cohesive property of gold in 1854 and the introduction of the rubber dam and the dental engine resulted in the development of some remarkably skillful operators. Dentistry at that time reached the acme of its possibilities with the means then available, and what was done was in the main well done.



## THE BEGINNING OF MODERN DENTISTRY

But the practice of dentistry since the early eighties has been completely revolutionized. Methods of saving teeth from the ravages of caries were not intelligently applied until after the publication of the results of Dr. W. D. Miller's investigations into the exciting cause of dental caries and those of Dr. G. V. Black, which came soon after those of Dr. Miller, into the physical properties of filling materials, and the announcement of his system of cavity preparation and instrumentation.

The operative dentist now-a-days who essays to save a decaying tooth knows what he wants to do and why, and he knows how to do it if he is on to his job, and if he isn't he had better change his occupation. Haphazard methods have been superseded by scientific, systematic procedures, which, coupled with greatly improved materials, instruments and appliances, have placed the practice of dentistry in a position of pre-eminence in its ministrations to humanity. Dr. Sanford G. Perry said in a paper read before the National Dental Association on "The Evolution of Dentistry," "Dentistry ministers to man's personal needs. He could live comfortably and reasonably happily without books, pictures, sculptures, music, railways, ocean steamers, trolley cars, automobiles and aeroplanes (and he might have added lawyers and nine-tenths of the doctors), but he could not be comfortable and happy without the ministrations of dentistry."

## IS DENTISTRY A LEARNED AND LIBERAL PROFESSION?

Complaint has been made that our profession has not received recognition as a learned and liberal one, and there is no doubt that such criticism of dentistry in the past has been fully deserved. Admittedly, the great army of dentists now in practice may not be remarkable for erudition, but, taken as a whole, it will compare favorably with any other profession.

Considered individually, dentistry can muster a great concourse of brainy men, who have contributed vastly not only to the advancement and upbuilding of their own profession but in many instances have become noted for what they have done in lines of activity outside their own special calling.

The claim to being a learned profession does not rest, however, upon the accomplishments of individuals, but upon the course of study required of the dental student and upon the literature of that profession. A comparison of the dental college curriculum of today with that of twenty-five or thirty years ago shows what a wonderful progress has been made in that time and how varied and scholarly the education of the dentist is. Dental literature also has made great strides onward in that same period until now, with her magazines and text books, dentistry makes a decidedly respectable showing.

A profession is considered liberal in proportion as its members contribute of their skill and knowledge to the general welfare of the community at large and to the relief of suffering without hope of pecuniary

reward. In this respect dentistry, until quite recently at least, has not shone forth resplendent. But events of the last few years, growing out of the development of the oral hygiene movement and the efforts to provide free dental services for the poor, and the time given up to the examination of school children's teeth, demonstrate that dentists are ready to be liberal with their services if they are given the opportunity.

Hospitals and institutions for the care of the sick poor have been provided in great abundance by municipalities, churches and societies or individuals, other than medical, and then the physicians and surgeons have been invited to come in and contribute their services: an opportunity to which they have responded nobly.

When the cities and societies and wealthy individuals provide dental infirmaries fully equipped and supplied with the essentials for a free dental clinic, just as the medical institutions are provided with everything required for their successful conduct, then, without the least doubt in the world, dentists will come forward and contribute their services with as much genuine liberality as have the physicians and surgeons.

So far, with a few notable exceptions, such free dental clinics as have been established have been the results of efforts by the dentists themselves and at their own expense. These are largely in the nature of experiments, it is true, for the purpose of demonstrating to the municipal authorities the practicability of the free dental clinic, with the idea in view that the cities would assume their conduct when proven feasible and worth while in results. But even experiments of this character are expensive and beyond the means of most communities of dentists, however liberally inclined they may be.

It is certainly a matter for our self-congratulation that our profession is everywhere actively engaged upon this work of noble self-sacrifice and that in nearly every city in our land and in other countries as well, the dentists are standing forth and offering their services in one of the most practical and beneficial of all charities, as soon as facilities are provided for its proper and successful operation.

When this great thing has come to pass, and it most certainly will come to pass in time, then dentistry will assume a position in the estimation of all men far beyond any cavil or criticism, and if there be now any opprobrium attaching in any degree to its practice it will disappear absolutely and completely.

#### THE STANDING OF DENTISTRY AS A PROFESSION

In speaking of the standing of dentistry I do not mean the social status of the dentist. That is an individual and personal matter. A man of culture and possessed of the social graces, if he has the ambition and the means to gratify it, may enter the social swim. The fact that he is a dentist need not militate against his becoming a social lion if he makes that his object. As a profession we are not concerned about that. But what does

concern us is the standing of dentistry as a profession in the minds of intelligent and discriminating people.

A profession is judged as to its standing by what its services are worth in alleviating suffering and distress by the sum total of its contribution to the welfare and happiness of mankind.

Judged by this standard, dentistry, in the minds of intelligent and observant people, is readily accorded a standing fully equal, if not a little superior, to any other profession.

#### SOCIETY WORK AS A SERVICE

When we contemplate what has been accomplished for the uplift of dentistry through the agency of society work, and realize that without it we would still be a benighted profession without a history of achievement and with no hope of a future, we must appreciate what it means to dentistry for every man who cares for his profession and for his own improvement to contribute his mite of service to that end by active participation in society work.

The problem that confronts us here in Kentucky is how to awaken a livelier interest in society service. There is a strange apathy among the dentists in this state in regard to membership in local or the State Societies.

The committee on local societies appointed a few years ago by the Kentucky State Dental Association has succeeded in getting only about half a dozen local societies organized.

I am gratified to find that you have such a live organization in Covington and vicinity, and I am sure you have experienced such signal benefit from it that you would not, under any circumstances, return to your former unorganized and unprofitable condition.

Such a society as this is bound to have a beneficial influence not only upon yourselves but upon the entire profession throughout the State. Why should not the Northeastern Kentucky Dental Society be a center from which will radiate an influence for good which will be felt all over the State and upon every ethical dentist in it who, seeing your good works, will be encouraged to go and do likewise.

We must all cooperate to carry this work of organization on further. More local societies must be organized and all should be components of the State Society, so that when the reorganization of the National Association is effected along the lines of the American Medical Association, we will be ready to enter at once as an integral part of the National organization.

#### THE PRACTICE OF DENTISTRY NO SINECURE

But I have gotten astray from my subject, though what I have been saying is not entirely irrelevant.

Let me say a few words more about the practice of dentistry and I will be done.

The work of the dentist is hard. Yes, it is very hard, and it is exacting. He who pursues it earnestly must give to it about all there is in



him. But to him who loves it, it never grows irksome. I am sometimes asked by patients, "Doctor, don't you get awfully tired working on people's old decayed teeth?" "Yes," I tell them, "I do get physically very tired, but I never grow weary of the work itself." There is no occupation I know of in which the work is so varied and interesting as in a full practice of dentistry. I imagine that at one time it may have been quite a bore, but practice has expanded so in recent years; so many new things are being done and new processes constantly being brought out and such neat and efficient appliances and instruments are supplied by the ingenious ones for doing everything, that our labors really are more delightful and entertaining than irksome. No two operations are just alike, and the constant change of patients cheers and freshens us up throughout the day, while the necessary employment of our skill and ingenuity to meet the problems that confront us gives us both mental and physical exercise. Nevertheless, the work of the dentist is hard. Our burden is lightened greatly when we do things because we love them and love things because we do them; when we are conscious of doing somebody a great service in restoring a lost function essential to that individual's health, of assuaging a pain or curing a wasting disease. Our burden is lightened by the assurance that when the work is done we will receive our reward; not always what we are entitled to nor what we might have expected, possibly only the consciousness of a duty well done. If the latter is our only reward, it is certain that no one can rob us of our fee.

Dentistry is a noble profession and we need never feel ashamed that we are its devoted followers. I close with another quotation from the paper of Dr. Perry:

"And how can we help feeling that God is with us in this work, which is making for the betterment of humanity!

"And the joy of it all: To dry the tears from the sweet eyes of childhood by gentle treatment, to comfort old age by tender ministrations, and to assuage pain for all who suffer—to say nothing of saving from it—is it not worth while? What other work in all the world is more like that of the Good Samaritan?"

### GIVE THE BEST YOU HAVE

Give to the world the best you have  
And the best will come back to you.  
Give love, and love to your life will flow,  
A strength in your utmost need;  
Have faith, and a score of hearts will show  
Their faith in your word and deed.  
Give truth, and your gifts will be paid in kind,  
And honor will honor meet;  
And a smile that is sweet will surely find  
A smile that is just as sweet.

—*Madeline S. Bridges.*

## THE URGENT NECESSITY FOR THE EXAMINATION OF THE MOUTHS OF THE CHILDREN OF THE PUBLIC SCHOOLS\*

By St. Claire Duke, D. D. S., New Orleans, La

**T**HERE is no question before our profession at this time, in my estimation, that should more appeal to us or demand our attention as the subject which I have selected for my essay today. We dentists have had lots of opportunities to observe the ill-effects of the neglect on the part of parents to have their children consult us until, oftentimes, it is too late.

The average, otherwise intelligent, parents are ignorant as to the importance of retaining the deciduous teeth intact in their children's mouths until the absorption of their roots has taken place; also, I venture the assertion at least ninety per cent of the lay public are in the dark as to the value of the sixth-year molars and the grave dangers attending the early loss of these teeth.

The dental profession is thoroughly cognizant of the absolute necessity of the masticatory apparatus to be in a healthy condition during the growth and development of the child, to say nothing of the dangers of dento-alveolar abscesses, necrosis, etc., in allowing badly broken down teeth to remain in the oral cavity, also to say the least, the unsatisfactory results caused by the early loss of any teeth.

The premature removal of deciduous teeth, as we all know, will often disturb the germs of the permanent teeth developing at that time; so will the early loss of the sixth-year molars cause mal-occlusion of the other teeth, and mal-occlusion, as we know, is a predisposing cause of dental caries, and lastly, disturbs the facial outlines.

The national and local governments expend millions of dollars every year in investigating the cause of and preventing disease among the lower animals. Are we human beings less entitled to such consideration at the hands of the government? Is it not the duty of our country to provide educational opportunities to its citizens? Such being the case, how can children be expected to accomplish much at school if they are continually suffering from the effects of lesions of the oral cavity, preventing proper assimilation of nourishment, physical and mental development, which naturally prevents them from applying themselves to their studies, also weakening their constitutions and making it more possible on exposure to infection of the different diseases.

Science proves that the average unhealthy mouth is reeking with millions of the different species of micro-organisms.

I notice in a recent news item where one of Uncle Sam's soldiers was court-martialed, found guilty and sentenced to serve two years at hard

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\*Read before the Louisiana State Dental Society, 1911.

labor for disobeying his superior officer, in refusing to have his mouth examined and treated by the army dentist. This seems to show that the national government is beginning to thoroughly realize the importance of dentistry.

The English government is having quite a lot of trouble because of the fact that the class of people that they draw the recruits from for the army and navy are very much below the physical average, which was caused by the men neglecting the care of the oral cavity, and now the powers that be in that country are discussing the ways and means of correcting this condition of affairs.

Germany, I believe, was the first country in the world to appreciate the importance of the examination and care of their school children's mouths, and today every town or city of any importance in that nation have dental inspectors in the public schools, who have accomplished wonderful results, from all accounts, and have improved the general health and happiness of the pupils, making better students of them.

New York, Boston, Kansas City, Kan., Cleveland, Chicago, Princeton and Bennettsville, S. C., and many other cities and towns, have inaugurated the system of examining the mouths of the public school children, and all of these cities report good results from this work. The latter city mentioned, I am sorry to say, is the only one in the South doing this class of work.

There has been some objection, I believe, on the part of some of our conferees, to the compulsory examination of the school children's mouths, claiming that it interferes with the private rights of individuals, but I don't believe for a moment that there would be any complaint, even from the most ignorant individual, the moment proper explanation was forthcoming, showing the advantages to be derived.

Even should there be numerous objections, what is the difference? Does not the school board regulate the attendance of the children? Don't they insist that each and every child must be vaccinated before being allowed to attend school? Do we hear of anyone calling this high-handed or undemocratic in violation of their constitutional rights?

No, for they have been educated up to the advantages of this work, in the prevention of disease, and so will every other innovation be received by the public that tends to benefit humanity.

In the city of New Orleans we have three medical inspectors, whose duty is to examine the school children from time to time, and they have done excellent work in preventing the spread of disease among the children. Yet I have failed to note that there has been any complaint about the compulsory medical examinations on the part of the parents or pupils.

With all due consideration for the good accomplished by the medical inspectors, I believe between the two that it is more essential to the public health and welfare that there should be dental examiners in the public schools. When this is done throughout the state, we will find that



the health of the children has been more properly conserved and future generations will show more fully physical, mental and moral development.

Concluding, I feel that too much cannot be said on the subject, and I earnestly appeal to you by the duty you owe our profession and humanity to take some action in this matter, and if we wish to accomplish anything we must keep on hammering away until we have compelled the proper authorities to appoint intelligent men to perform these duties. I think every city and town, even with populations of five and six thousand, should have a dental examiner, and a city the size of New Orleans should have at least four to properly cover the ground and do satisfactory work.

The work should be so arranged that the examiner would visit each school in his district at least twice each session, making duplicate diagrams of each mouth, with explanatory notes, one to be submitted to the parent or guardian of the child, and the other to be retained by the examiner and filed away as a permanent record.

## **PATHOLOGIC RELATIONS OF THE TONSIL TO THE TEETH\***

**By Dr. Walter E. Murphy.**

*Associate Professor of Rhinology and Otolaryngology Medical Department, Cincinnati University*

**S**URROUNDING the combined opening of the digestive and respiratory tubes, we find a ring of lymphatic tissue (the Ring of Waldeyer) composed of the pharyngeal, faucial and lingual tonsils and a lateral pharyngeal chain. The location of this lymphoid tissue at a point where the ciliated epithelium of the lower respiratory tract ceases its function of sweeping out micro-organisms and the protective action of the saliva, by inhibiting bacterial growth, is no longer present, must naturally lead us to form some theory as to the cause for this location. It has been shown by the work of Retterer that the tonsil is not a vestigial remnant from the lower animal, as he has observed the absence of the tonsil in all lower animals up to the crocodile, and that it attains its fullest development in man. The function of the tonsil has never been satisfactorily demonstrated. Originally it was supposed to furnish a lubricant for the bolus of food, to aid in deglutition; also that its secretion was an aid in the digestive function; more recent investigators are investing it with other functions, the soundness of which theories is yet to be definitely determined. Sheedy claims for them, in young children, the ability to prevent bacterial invasion, and Good advances the theory that the tonsil acts as a laboratory for the production of anti-toxines from the bacteria lodged in the tissue. These anti-toxines, being absorbed, have an immunizing action, guarding the child against infection from these bacteria.

### **ANATOMY**

Anatomically, the faucial tonsil consists of lymph follicles held together by connective tissue. Its internal surface is covered by mucous

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\*Read before the Cincinnati Dental Society.

membrane and divided by foldings of this membrane extending down into the tonsillar crypts. The external surface is covered by a firm connective tissue membrane, its capsule, through which the efferent lymph vessels pass to the cervical lymphatics and from them to glands at the apices of the lungs. It has no efferent vessels, so consequently is not affected in the same manner as the other lymphatic glands. Absorption is through the mucous membrane, or through areas of denuded membrane in the crypts, and through the blood stream. Through this door many of the acute infectious diseases find entrance into the body. Such are scarlet fever, measles, small pox, diphtheria, pneumonia, la grippe, meningitis and typhoid fever. When there is no obstructive interference with respiration, the nose has the ability to overcome these organisms, and they are not allowed to pass farther into the system. The examination of the mucosa of the nose of healthy individuals will show the presence of various pathogenic germs in varying quantities.

At birth the normal faucial tonsil is very small and attains its fullest development about the sixth or eighth year, and then begins to atrophy, so that by the age of twelve or fourteen years it should have disappeared to such an extent to leave only a cicatricial mass between the pillars of the fauces.

Any tonsil that shows plainly, on inspection of the throat after that age, may be considered as pathologic in character and an object for surgical treatment. And during this period of life and later various conditions of the tonsil stamp it as a menace to the health of the individual both locally and generally, and calls for removal from a prophylactic point of view.

The conditions which call for surgical interference may be classified as follows:

(1) Simple hypertrophy, which interferes with respiration, and by increased size causes pressure upon the surrounding parts sufficient to affect the development of the jaw and also interfere with the action of the stylo pharyngeus, stylo-glossus, and constrictor muscles of the pharynx.

The hypertrophy of the superior lobe will interfere with the action of the muscles upon the pharyngeal end of the eustachian tube. Also we note the interference, by pressure with the proper circulation of the blood supplying nourishment to the surrounding parts, and to regions more remote, namely, the brain, and in this way curtailing the mental activity of the child.

(2) The second class consists of tonsils not necessarily enlarged but subject to various diseased conditions, which cause local or constitutional infections; and let it here be stated that the size of the tonsil has nothing to do with the amount of local or general infection which may develop.

The most frequent affection is the acute follicular or lacunar inflammation, with its frequent recurrence, and liability to termination in peritonsillar abscess, the seriousness of which condition has recently been demonstrated to myself in the case of a man 35 years of age. He came to me with a very severe infection of the crypts of the left tonsil, with the usual

local and constitutional symptoms. In spite of all my efforts to prevent, he developed a peritonsillar abscess. This I opened and drained of a very foul-smelling pus. The second day after the formation of the pus he showed an eruption on the chest and extremities purpurial in character, and on examination the urine was found to be loaded with albumen, casts and blood, showing a purulent infection of the kidneys. This was cleaned up until there is no trace of albumen at present.

The most dangerous is the cicatricial tonsil, which through chronic inflammation of long standing has shrunk to a firm mass, full of crypts distended with a cheesy, foul-smelling pus. This constant source of infection disseminates its poisons promiscuously and at all times. These chronically inflamed tonsils are responsible for disease in so many of the other organs of the body that when tabulated the list is startling in its length.

The toxins from the chronically inflamed tonsil are being continually absorbed by the system, through the blood and lymph channels direct, or by passing into the stomach are absorbed and carried to the various eliminating organs, causing an overtaxing of these organs and consequently an impairment of their functions.

There is no question of the importance of the tonsils in relation to the field of dentistry. Much has been written upon this from the viewpoint of the orthodontist. So I shall pass over to a phase of the subject not so frequently considered, the effect upon the health of the teeth. Diseased tonsils affect the teeth in three different ways. (1) By the impairment of the general nutrition, and consequently interference with the proper development of the various structures of the teeth. (2) By contributing very largely to the local invasion of the teeth by the numerous bacteria that infest the crypts. (3) And by the obstruction and pressure, interfere directly with the proper blood supply to the teeth. The interference with proper nutrition may result in various conditions referred to the teeth but which cannot be relieved by the dentist, but must be met by the laryngologist. The co-existence of disease of the tonsils and teeth make the diagnosis all the more difficult. As an example—*tiedouloureux* results from other conditions in the mouth aside from bad teeth, as has been recognized by one of your members, Dr. Fletcher, and led him to call upon the stomatologist to remedy these conditions, probably better results would be obtained in the field of laryngology.

The air inspired by the mouth-breather comes in contact with the delicate structures of the throat without being warmed or moistened by the nose, and with no opportunity for that organ to sift out the various bacteria. Not only is the air inspired improperly prepared for the lungs, but an insufficient amount of oxygen is absorbed, thus depriving the body of one of its most essential foods, and consequently the impairment of nutrition to the teeth, weakens their resistive power and exposes them to the invasion of various destructive bacteria present in the mouth.



The infected tonsils acting as a culture ground for bacterial growth, through its proximity and through the circulatory channels, lend aid to the further invasion of the teeth.

The examination of children suffering from obstructive conditions in the upper respiratory tract, shows a great majority of them suffering from carious and deformed teeth, due to this improper nutrition, and the increased liability to infection from bacteria as well as the exposure of the teeth to the cold air inspired.

The impairment of the sense of smell in mouth-breathers deprives the individual of a great gustatory pleasure, as taste and smell are so closely associated. This will lead to lack of proper mastication of the food, will lead to the ingestion of improper foods and result in injury to the teeth, through lack of use, through infection from bad food, and through malnutrition.

Wright has found an enlargement of the tonsils at the periods of eruption of the teeth, at about the ages of 2, 6, 12 and 17 years. This swelling of the tonsil, when present, can only be accounted for by an increased blood supply to the teeth and the tonsil participating in this increased supply. There being no lymphatic channels from the region of the teeth to the tonsil, we cannot explain the enlargement as due to a lymphatic involvement.

In closing, let us state that it is of the greatest importance to establish nasal breathing in the infant and to see that it is continued through adult life, because of the many untoward conditions which may result from any deviation from the normal. It is Nature's safeguard against local or general infection, and an improper physical, mental and moral development, one of the most important of which is the development and preservation of the teeth with which to perform properly the act of mastication.

628 Elm Street, Cincinnati, O.

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## BRIDGE WORK, USING GOSLEE FACING\*

By Dr. Edgar L. Giffen, Detroit, Mich.

This clinic illustrates the use of Goslee Facings and the Tatham gold mesh. The object of the facing is to have a body of porcelain that will stand mastication and also will help to avoid the show of gold. The idea of the mesh is to strengthen the wax copings and to facilitate handling the wax model without distortion. The mesh also helps to control shrinkage in casting, and also provides a good edge for burnishing.

The technique of using the mesh is as follows: Take the facing and press the mesh to place over the base, approximately, then remove and pour some hot inlay wax on, inside of the mesh. Then press to place over the facing, and with a small burnisher burnish the gold mesh over the edges. Remove and trim. Then take a sharp instrument and warm and force

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\*Clinic at Southwestern Michigan Dental Society.

into the hole, fit base of crown through wax impression. Now take either iridio-platinum or clasp gold wire, Davis crown pin, and warm and force to place. Now the tooth is ready to put on the model. All the dummies are made in this way. Then take a piece of mesh and, after carving away a little of the plaster model, press a piece of wax over where the bridge will be, remove and flow some warm wax in, then press to place again. Now put facings in place for articulation and attach to the base already on. Build up to the contour of the natural tooth, saddle effect. When all attachments are waxed to satisfaction, remove facings and invest ready for casting. After burning out the wax a higher pressure will have to be used in casting than if casting without the mesh. With the air pressure machine at between fifteen and twenty pounds' pressure, after casting, remove the casting, clean it, and it is ready to solder to the abutment.

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## THE PHYSIOLOGICAL AND PATHOLOGICAL RELATION BETWEEN THE NOSE AND MAXILLARY SINUS.

By **Homer Dupuy, A. M., M. D.,** Oto-Laryngologist—Charity  
Hospital, New Orleans

**M**Y PRESENCE here means that you are naturally interested in a subject which has long proved a bone of contention between the dentist and rhinologist. I am delighted, however, to extend the olive branch of peace to this distinguished body, for by surgical conquests the maxillary sinus is rapidly passing over to the field of rhinology.

The more recent anatomical and clinical investigations have established that all the nasal sinuses are accessory cavities of the nose. The maxillary sinus is, therefore, an appendage of the nose, so that between these two parts there is continuity and contiguity of structure. The sinuses assist the nose in its all important function of (1) heating, (2) moistening, (3) filtering the incoming currents of air. Enormous blood supply goes to the nose to carry on this work. The air before it reaches the post-nasal space is approximated to the body temperature, 98 degrees. The maxillary sinus, with its enormous area of mucous membranes, containing numerous mucous glands, is the most severely taxed of all the sinuses in giving heat and moisture to the inspired air. Its increased functional activity must certainly predispose it to disease, when contiguous structures become affected.

Which sinus is the most frequently involved is still a mooted question. The great amount of heat and moisture given off by the mucous lining is greatly reduced when this sinus becomes the seat of disease, and thus the inspired air loses in purity. This deterioration in quality has ulterior ill-effects on the human economy.

\* \* \* Anatomical variation in the architecture of the sinus itself and of contiguous structures largely determine its vulnerability to infec-

tion from the nasal side. The normal outlet of the sinus empties into the middle meatus. This position of the outlet—the floor of the sinus—is unfavorable for irrigation, and this feature in itself predisposes to retention of secretions within the cavity. The presence of several accessory outlets near the one normal outlet is fairly constant and may relieve the situation when the sinus is filled with secretions. This normal outlet was once utilized for catheterizations in the hope of relieving pus accumulations. The procedure is painful, extremely difficult of performance, and surgically inefficient. It is crude and deserves to be completely abandoned as a point of entrance to the sinus. The lower the floor of the sinus the more favorable are the mechanical conditions towards retention of secretions; on the other hand, a floor not far removed from the outlet favors natural irrigation from the sinus. There is constant variation as to the position of this floor. In the light of our recent surgical advances a low floor, one on a plane with the floor of the nose, presents favorable features for the intra-nasal puncture of the naso-antral wall, as by this procedure we *secure drainage at the lowest level of the antral floor through the nasal cavity.*

The natural drainage of the maxillary, frontal and ethmoidal sinuses is in the middle meatus. Here is the common meeting point. Whether or not the secretions from any one sinus be healthy or pathologic, the middle meatus is the common outlet. Pus in this region may, therefore, infect other sinuses. This outcome will largely depend on the conformation—position—and general arrangement of the parts around the middle meatus. This applies in a particular way to the *middle turbinated bone*—its size, its position, whether it infringes on the meatus so as to interfere with natural drainage—whether its undue enlargement interferes with the outflow of secretions from the various sinuses. We have in the middle turbinated bone one of the keys to the situation, should the bone, as it often does, interfere with the drainage of these parts, we readily see how pus from a sinus, not finding a free outlet, will back up into some other sinus, with an infection of it as an end-result. Thus the frontal sinus secretions may drain into the maxillary sinus infecting it—the maxillary may in turn cause extension of the trouble into the ethmoidal sinus. And we have thus a *vicious circle*, all arising from the deficient drainage induced primarily by an enlarged or by an unfavorably situated turbinated bone, or by some other bony defect in the region of the middle meatus. The presence of polypi may also interfere with the drainage of this area.

That portion of the naso-antral wall lying under the inferior turbinated bone is an anatomical point of extreme importance in the modern surgery of the antrum. It is along this area that we puncture the naso-antral wall to gain entrance into the sinus for purposes of irrigation in the subacute, and even in some of the chronic affections of this



cavity. On radical operations about the antrum for the cure of long standing suppurations, after closing the buccal wound, through which curettage of the antrum has been practiced, we break down a portion of this wall for the future post operative intra-nasal irrigations. It is quite evident that draining the sinus from this low point into the part normally related to it, the nasal cavity, presents many advantages over the alveolar route.

\* \* \* Continuity of parts between the nasal cavity and antrum is made all the more intimate when we note (1) that embryologically the nasal sinuses are off-shoots from the original nasal sacculi, (2) the nasal mucous membrane with some slight attenuation lines the sinus walls. We have here a natural arrangement for the extension of disease from the nose into any particular sinus, or from the sinus into the nasal cavity itself, or from one sinus into the other. It is approximating the true percentage to state that sinus troubles account for 60 per cent of nasal diseases. When we consider the prevalence of grippe and its predilection for the nasal accessory cavities, it is not difficult to explain the enormous increase in sinus affections since the advent of grippe. The interrelation between these cavities and any obstruction to natural drainage will certainly promote the extension of disease from one sinus to the other; the antrum bears no special immunity to this invasion. Such diseases as Scarlet Fever, Measles and Diphtheria seldom fail to involve the nasal cavity, leaving more or less some pathological impress on these parts; this may lead to permanent alteration in the nose and to changes in one or more of its accessory cavities.

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## MANIFESTATIONS OF SYPHILIS IN MOUTH AND RELATIVE PARTS.\*

By H. H. Haynes, D.D.S., Clarksburg, West Va.

**T**O BEGIN with, it will probably be well to run over the primary, secondary and tertiary lesions that affect these parts in acquired syphilis, and later we will take up the manifestations of congenital syphilis.

### PRIMARY LESIONS

Chancre and adenitis are the primary lesions of syphilis. The chancre always appears at the seat of inoculation. The first manifestation is an eroded papule, which appears after a few weeks incubation. The accompanying adenitis does not make any manifestation in the mouth, but the glands of the neck are so readily examined that it seems not amiss to mention them here. The post cervical glands are of special diagnostic significance.

### SECONDARY LESIONS

After a few weeks the secondaries appear. These are a typical exanthemata upon the skin and mucous membrane. The iritis, periostitis and toxemia have no place in this paper.

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\*Read before the West Virginia State Dental Society, 1911.

If untreated or not sufficiently treated, the localized secondaries have a tendency to relapse, after intervals of apparent health, for a period of at least two years.

The secondary syphilides of mucous membranes, or any part of the skin which in texture and moisture stimulates the physical condition of mucous membrane, presents quite a variety of appearances, and are classified by Keyes as follows:

- 1st, Mascular syphilis;
- 2d, Erosive or papulo erosive syphilis (M-patches);
- 3d, Ulcerative syphilis;
- 4th, Squamous syphilis.

The mascular syphilis is unimportant.

The papulo erosive and ulcerative types (mucous patches) are common in the first year, and appear infrequently for several years after the inoculation, if the case is untreated. If properly treated, as a rule they do not persist for any length of time.

The squamous types are rarely seen before the second or third year, and may continue indefinitely thereafter. The localized secondaries are superficial, usually show a tendency to spontaneous cure, and, generally speaking, are not destructive of tissue and do not form permanent scars. *They are, however, highly infectious.* This is a point of great importance to be remembered.

The tertiary lesion may occur at any time after the appearance of the chancre (Keyes). There is some difference of opinion as to this; some do not think they occur as early as that. However, they rarely appear until after the first outbreak of secondaries has subsided.

The tertiary lesions differ from the secondary in that they are clinically not infectious. (Note the word "clinically." They are infectious, but not *clinically* infectious. I will explain that later.) They are deep rather than superficial in location, and are destructive to tissue and show little or no tendency to spontaneous cure. The tertiaries attack every organ. The histology of the tertiary lesion is either a specific syphilitic granuloma (gumma) or a diffuse interstitial sclerosis.

Parasyphilides or quantenary lesions are not seen in the mouth.

#### SYPHILIS OF THE MOUTH

Occasionally we find primary chancre upon the lips or tongue, but secondary lesions are much more common. The mildest form of the secondaries is a simple erythema or angina.

The most common and by far the most characteristic secondary manifestation of syphilis in the mouth is the mucous patch. It appears in small flattened patches of a dirty, grayish or grayish-yellow color, which may be situated on any part of the oral mucous membrane, but are more frequently seen on the tongue, gums, or near the angles of the mouth.

Occasionally the superficial epithelium assumes a characteristic bluish-white, pearly appearance, closely resembling the corrosion produced by

silver nitrate. These are termed opaline plaques (*plaques opalines*). They may be found on the lips, cheeks or tongue.

Leukoplakia are very closely allied to the opaline plaques, the leukoplakia presenting a little more thickening of the squamous epithelium, due to the chronic inflammatory process. These are usually situated on the tongue.

Gumma of the mouth are situated most frequently in palate, tongue or gums.

Gumma of the palate begins as any other gumma. It is at first a deep-set syphilitic tubercle, the center of which soon breaks down into a gelatinous or gummy mass. When this degenerative process reaches the surface you have a deep, irregular ulcer, which, if not arrested by heroic treatment, will soon perforate the palate.

The phagedenic gummatous ulcer of the palate is rarely seen, but if once seen it makes an impression that is not easily forgotten, and it would be hard to mistake it for any other condition. At the onset there is a general infiltration, producing redness and *sumefaction*. The velum is almost immobile, but the patient complains of little or no pain and usually takes very little interest in the condition till ulceration and phagedena set in. A few hours after phagedena sets in, it changes the seemingly insignificant, painless infiltration to large areas of necrotic, foul-odored tissue; or perforation may occur over night.

Gumma of the tongue occur about the center of the dorsum, and when they reach the ulcerative stage they present a deep, irregular cavity having thickened or undermined edges and a base covered with a dirty grayish-yellow slough. Gumma of the gums present the same picture as above described.

This is a rough picture of the syphilis of the mouth, and we will now take up the relative parts. Of the relative parts we will consider only the oral pharynx and the nasal fossae and nose.

#### SYPHILIS OF THE ORAL PHARYNX

Primary chancre may be found on the tonsil, but this is very rare.

There is a syphilitic sore throat which takes the form of a catarrhal inflammation. This is very similar in appearance to the simple variety of sore throat.

Mucous patches are commonly seen on the tonsils, and it is not very rare to see them on the soft palate or posterior wall of the pharynx.

Opaline plaques may be seen on the tonsils, but they are rare.

Gumma often involves the tonsils, and may be seen on the posterior wall of the pharynx.

#### SYPHILIS OF THE NOSE

Syphilis often produces a purulent rhinitis during the eruptive stage of acquired syphilis, and condylomata may be found in the nose. But the common lesion of the nose is the gumma, which may begin in the mucosa or in the bony and cartilaginous structures.



If unchecked by treatment this gummatous condition usually leads to perforation of the septum or hard palate, and the production of the well known saddle-shaped deformity of the nose.

It may even not stop at this. I saw a patient a few months ago who had lost his entire septum, the turbinates and body of the ethmoid on both sides, and the greater part of the inner wall of both antra, together with more than half of the nose. All except the bridge of the nose was entirely destroyed.

Destruction of the alae nasi, in whole or in part, is very commonly met with.

#### MANIFESTATION OF CONGENITAL SYPHILIS IN MOUTH AND RELATIVE PARTS

These are, of course, only secondary and tertiary lesions, and the syphilitic stigmata.

Mucous patches are very common upon the vermilion border of the lips of infants. These have a strong tendency to fissure, and the fissures are deep, oozing cracks of a raw ham color, and are commonly surrounded or covered by dried secretions. These fissures are especially prominent around the angles of the mouth, and as they heal leave prominent, radiating, linear scars on the lips. In later years these form one of the most characteristic stigma of congenital syphilis.

Mucous patches of the mouth are not as common in the congenital as the acquired form. The ulcers of the mouth are not characteristic and are hard to distinguish from aphthous patches. The condition of the infant is usually so run down that it is hard to tell, even when you are looking at the child, whether or not they are true syphilated ulcers.

Gummata may occur in the mouth, but are rare.

The effect on the teeth is, no doubt, of very great interest to you.

Holt claims that there are no peculiarities in the first teeth of syphilitic children, except their proneness to early decay, and they are rather more likely to appear early than late.

The dental stigmata of hereditary syphilis are due to the marked constitutional disturbance while the teeth are in process of formation. The permanent incisors and six-year molars are most often affected, because they are in process of formation during the first few months of extra-uterine life, which is the most virulent period of hereditary syphilis. It must be borne in mind that any severe, prolonged constitutional disturbance at this time may produce dental stigma, and it should be remembered that congenital syphilis may not affect the teeth, especially when the case is mild, or has been well controlled by medicine. Congenital syphilis may not affect the teeth. If a child has good teeth it does not, by any means, exclude congenital syphilis. If it is well treated, or if the child has good resistance, its teeth may entirely escape, and positive appearance appear later.

Hereditary syphilis may produce practically any deformity in size, shape or position of the teeth. The most typical, however, are the Hutch-

inson teeth (which are not pathognomonic). This deformity, while not confined to any tooth, is most pronounced on the permanent upper central incisors. The typical Hutchinson incisors are under-size, peg-shaped, and show a peculiar erosion on the free border which is crescentic in shape and very prominent on the anterior surface of free border. They present a single crescentic notch in the center of the edge. The enamel is usually defective in the center of this notch, and discoloration here is common.

Fornier's teeth are probably next in importance. This is an erosion on the summit of the six-year molars. About three-fourths of the tooth are normal in appearance; the terminal one-fourth is shrunken and irregular in appearance, and usually separated from the healthy part by a distinct ridge.

There are the so-called screw-driver teeth, which are often produced by syphilis or any other grave constitutional disturbance while the teeth are in process of formation.

#### THE ORAL PHARYNX

Ulcers and gumma of the pharynx are not common. The usual condition is a chronic pharyngitis. If severe and protracted, this may interfere with the development of the throat, which may in later years cause the throat to present a contracted appearance.

#### THE NASAL FOSSAE

Coryza, or snuffles, is one of the earliest and most common symptoms of hereditary syphilis. It usually begins between two and six weeks (of extrauterine life). At first there is little or no discharge from the nose, but the mucosae is congested and swollen, producing nasal obstruction. The nasal obstruction causes the child to breathe in a characteristic snuffy way and interferes seriously with nursing.

This congestive stage is rapidly followed by a subacute catarrhal rhinitis, which is attended by a profuse sero-mucous or mucopurulent discharge, often tinged with blood. The discharge is acrid and excoriating.

At this stage the mucosae is chiefly involved, and unless neglected ulceration and perforation are rare. The inflammatory process, however, interferes with the development of the nose, producing flattening or broadening of the bridge and atrophy of the alae. The continuous excoriating discharge, if neglected, produces stenosis of the orifice of the anterior nares, which at times is very marked.

Rhinitis of late hereditary syphilis is a very different pathological condition. Here we are dealing with gummatous deposits which break down and destroy the mucosa and underlying tissue, and in extreme cases the entire septum turbinates and the alae of the nose are destroyed; and ulceration may even extend out on the cheek.

## THE NOSE

Flattening or broadening of the bridge of the nose, when very pronounced (and you can exclude trauma), are almost pathognomonic of syphilis.

If, in addition to this, you find the radiating linear scars on lips, it is considered positive proof of the disease.

The point and alae of the nose often show atrophy or contraction, and may even show partial or complete destruction of one or both.

Prolonged syphilitic rhinitis, if severe or neglected, is sure to show contraction or lack of development of the orifices of the anterior nares.

It is very important to bear in mind that congenital syphilis may be present and show absolutely none of the lesions above mentioned.

Occasionally a child will grow well for a few years, and all symptoms of syphilis escape the notice of intelligent parents and a careful physician: and suddenly gummatous destruction appears, causing perforation of the septum or palate before the condition is recognized. Fortunately, the primary and secondary lesions are the only ones that are clinically infectious. When they are of such a nature as to be infectious, they are always visible and so characteristic that the careful dentist should always, at least, suspect the condition, provided a careful examination of the mouth and pharynx be made. When suspicious lesions are seen, the dentist should use every precaution to protect himself and other patients.

I have three skulls here that I think will give you a better picture of the effects of syphilis than I can in a paper, and I will show you those.

This first specimen shows the typical screw-driver teeth, the lack of symmetry of the face, and the so-called paper skull, and the worming bones, they cut through here, five worming bones at the posterior part of the skull. And all that taken together, while I never knew this patient in life, I feel quite positive that the condition was produced by syphilis. This condition of the teeth may be produced by any severe constitutional disturbance in the first two months of extrauterine life. It is an injustice to suspect one of syphilis having just these marks, but having these other marks made it almost positive.

This is a specimen showing what acquired syphilis will do. In this skull you will see how much the bridge of the nose is flattened here and the entire septum gone. There is destruction and perforation of part of the hard palate, the turbinates destroyed, and the base of the alae practically eaten away. You can easily see when you look at this why you find the saddle nose.

This is the same thing, except more exaggerated. This is entirely eaten away. While I never knew this patient, I would be willing to wage any reasonable amount that the nose in this case was eaten off: he just had one hole in his nose and went around for years with it before the death of the patient.



## DISCUSSION

DR. H. H. HARRISON, Wheeling: Mr. President, Gentlemen: I am like the rest of you; I don't know much about it. I have practiced dentistry for forty years and I have never seen a case, and I don't want to see a case, and I am glad the fellows are dead who owned these skulls. It is a matter that is of some importance to us, as a matter of course. As a diagnosis of conditions that exist in the mouth, they should be looked after; and when we find cases of that kind, not to handle anything of that kind but pass it over to the physician. I don't want to handle anything of that kind.

PRESIDENT WALKER: I am rather surprised that a man can be in practice as long as Dr. Harrison has and not come across a case or some marks of syphilis in the mouth. I have no doubt it is true, but I think it is very remarkable. I know there are a number of doctors here who have seen it, and I would like to hear from them.

DR. M. B. WEST, Parsons: I have not been practicing continuously for forty years; only for about twelve years, and very unfortunately I have seen some two or three very marked cases. But what I wish to say is this, that the barriers or difficulties we dentists have to contend with largely are not so much from acquired syphilis but congenital or syphilitated conditions; hereditary syphilitic conditions confront dentists more today than acquired syphilitic conditions from this fact: That the child comes into the dentist's chair with abnormal developments. I had a case of congenital syphilitic condition that was a very peculiar condition. I have related it to one or two of the doctors. In my town there is a family—a very peculiar case, I should think. I have tried to get the young man I speak of to come down here; I offered to pay his way, but he would not do it. I never as much as hinted a suspicion to him that his trouble might have been the result of some syphilitic condition. There is one boy about twenty years old and a girl who said she was sixteen, and a younger sister about eight or nine, and other members of the family, but those came under my direct observation. The boy seemed to have the superior maxillary bone perfectly well developed until he was seventeen years old. At that time there was an abnormal development of the left side, or lack of development on the right side; he had perfect occlusion on the right side of the face but not on the left. Down around the central incisor it extends down 1/16 of an inch below the other side of the face. I sent the boy to Dr. Strach. Dr. Strach told him that there was nothing that would do him any good. He didn't understand the case very well, and I have never been able to understand it; and what makes it more complicated is a sister who is exactly the same. She was in the office Monday morning and the teeth on the right side of the face seem to be inclining lingually; on the outside of the face a little buccally. I do not understand it, but Dr. Strach intimated that that peculiar development might be the result of a congenital syphilitated condition. That is the reason, I believe, that our greatest difficulties are from the congenital consequences of syphilitic lesions.

DR. C. H. CHAPMAN, Webster Springs: I am surprised to hear Dr. Harrison and some of the others say that they have not seen syphilis as yet. I have not been a resident of West Virginia very long, but I have practiced in the city of Richmond, Va., and there we see more syphilis than you ordinarily see in the country. In West Virginia I have never seen a case. But there we see it often. I don't know how many cases I have seen, and how many cases treated from a dental standpoint, and I do not assume to speak because I know any more about it than the rest of you. But I would say that among the lower classes you see it quite often, and sometimes among the good classes also in the city. But there is one mistake, and I suspect the case that this gentleman mentions—now let us review or think back for a moment (the biological and histological names have gotten away from me). We know that hair, teeth and nails are of the caudal system. If a child, when it is developing the enamel of the teeth, gets a fever of the skin, like chicken pox, it will make a mark on the enamel of the teeth, and we mistake that quite often for syphilis when it is not syphilis. At about the age, I think, of fifteen months a child is forming the enamel on some of its

teeth; anywhere from a year to two years. If that child has measles you will see the pits on the teeth, especially on the lower molars. You have seen cases where the lower molars were pitted full of holes, caused by that fever of the caudal system, and we mistake it for syphilis. One reason how I came to know is that a gentleman sent a patient to a physician in town; the physician refused it; they sent him to the dentist, saying, "Go to the dentist and get your teeth all fixed up to eliminate the ulcers of the mouth." A physician sent me a patient that looked suspicious, but it had been a case of measles. At first the patient didn't remember ever having it, but her mother recalled that when she was only fifteen months old she had measles. When your patient says, "I have got an awful sore throat," become wise; look around; take your mirror and look in there. If the throat is sore and you can see whitish looking patches on the inside of the mouth, look for copper-colored spots at the back of the head in the hair; and if the patient gives a history of the hair being loose, you can believe the patient has syphilis. Then be careful of your hands, and you had better use formaldehyde pretty freely. My practice is to take a stone and polish those sharp points off and put them on an antiseptic mouth wash, and get rid of it just as quickly as I can.

**PRESIDENT WALKER:** Dr. Chapman brought out a good point, that we sometimes think we see syphilis when we do not. But did it ever occur to you that many a case of syphilis has passed under our hands in such a stage that it was absolutely dangerous to us and we did not recognize it? Stir around in your memory a little and see if you do not recall something that has pretty nearly passed you before you found out the danger you were undergoing; and it may have passed and you never did find it out.

**DR. JOHN H. MCCLURE, Wheeling:** Personally I know very little about this subject. I have had a great many cases sent to me by physicians. Physicians usually send them and instruct you what it is before they send. I do not rise to make a disquisition on the subject at all. I think that Dr. Haynes' paper is very timely and well taken; I think it is a good paper and a benefit to us all. I think that a surgeon coming before a dental society is as much at a disadvantage as a dentist going before a medical society. It is a different line of thought from what we are used to—what we study, as a rule, though of course we get a little of it. I think it is in the line of instruction more than a subject to be discussed, because we know little about it, except the oral manifestations. I did not get up to give anything on the subject, but I think we owe a vote of thanks to Dr. Haynes for the magnificent paper he has given us.

**PRESIDENT WALKER:** Dr. Haynes in his paper made an assertion referring to a clinically infectious case or otherwise infectious, if I understood him aright. I wish he would clear that up.

**DR. H. H. HAYNES, Clarksburg:** The conditions of syphilis that are clinically infectious are the secondary and primary lesions. The reason for this is that in the primary and secondary lesions the cause of syphilis is superficially located and is very active in these lesions. It has been the general idea for years of quite a number of good physicians and surgeons throughout the world that the gummatous formations, being different in their physiological appearance, and not being clinically infectious, were not produced by the same virus. It was only in 1905 that the true cause of syphilis was discovered. In the gummatous formation they are clinically infectious: They transmit by the breaking down and removing of the gummatous formations that are not on the surface. They can easily transmit the disease to animals by inoculation with these gummatous tissues. That shows that they are, in the truest sense of the word, infectious. The reason that they are clinically not infectious is simply because when the gummata break down the bacteria get in there and destroy all the structure on the surface, but only enough to affect the patient. When syphilis is repulsive, as a rule there is very little danger. When you get the destruction of the tissues of the nose and all that, at that time you are not in one-tenth the danger as when the patient comes in in apparently good health. Then you want to guard against it. The congenital syphilitic condition—if a person has not had congenital syphilis

at the time they grow up and are working on their second teeth, or after they are a few years of age, they are clinically not infectious; it is perfectly safe. It is infectious if you get down into the deep tissues.

DR. W. J. JONES, Columbus, O.: This congenital syphilis could be the father of the syphilitic?

DR. HAYNES: It is not transmissible to the second generation.

DR. H. H. HARRISON: I said I had never met a case of syphilis in my practice of forty years. I have met with some cases that I suspected; I did not positively know it. I do not think we dentists are supposed to treat a syphilitic case. We are sometimes called upon to treat the results of it, but I think we should all recognize the fact of perfect protection of ourselves from every single case, no matter whether we are sure or not, so we will not be in any danger. That is all I see we have to do with syphilis.

DR. W. I. JONES, Columbus, O.: I did not hear the paper. I know it must have been an excellent one from what I have heard of the character of the man who read the paper. I am not able to discuss it in a scientific manner, but I am always glad to hear a paper on this subject read before a dental meeting. It is a plan in my office to treat them all as though they had spiral teeth. I think it is safe. The important thing is, we ought to sterilize our instruments, hands and surroundings. I should like to know a great many things about it, but I wish to confess I did not hear all of the paper and I know that I am not capable of discussing it.

DR. F. R. STATHERS, Clarksburg: I would like to hear Dr. Haynes tell of a patient who has suffered with a gunshot wound in the superior maxilla.

DR. HAYNES: If Dr. Stathers had given me a little warning I might have gotten this up, but I can give you the details. About two weeks ago Sunday a little girl nine years old was brought to the hospital who was shot the Thursday of the preceding week. Her brother, a child a few years older than she, was playing with a 12-gauge shotgun with a 16-inch shell in it, and for that reason thought it would not shoot—which accounts for there not being more tissue destroyed. The shot entered under the eye on the left side of the face, the gun being within a few feet of the child's face. It tore out a round piece, completely destroying there all of the tissue, ranged down, and I suppose the center of the load must have struck about the center of the child's molar, or about in that region. The entire superior maxilla was destroyed with the exception of the antrum, and all of the teeth on both sides were entirely destroyed. The nasal processes, the frontal processes and the palate processes are all that is left, and the nasal processes are all that is left of the superior maxilla on both sides. The lower teeth were struck, and apparently the force just turned a piece of the jaw out without tearing the teeth out of the inferior maxilla; on the left side broke the lower jaw into four pieces; one extending from the angle of the jaw, one about from the junction of the molars with the cuspids, and another one through the center. At the time the child was brought in there was intense suppuration, pus pouring out of the wound, and the mouth and child's tongue swollen so it could not eat, and at this stage the entire hard palate and quite a little of the soft palate were entirely destroyed, and a portion of the tongue. There was nothing that could be done in plastic surgery on account of the infectious condition; all we could do was to irrigate the child's mouth and clean it out. We got forty shot out of the face. The nose had stopped it, and when it reached the other cheek it had done practically no damage. I had Dr. Stathers up looking at the case for his suggestions. It looks as though the child will recover, and it seems a pity that it should recover, for it won't be able to eat or talk, and the secretions of the nose drop down into the mouth. We would like to get suggestions from anyone as to what to do. I am afraid that the trauma will destroy the nucleus of the wisdom teeth; I doubt if the child has any wisdom teeth. If they were coming in it would help some, but as it is there is nothing to anchor to, as I see. I would like to have some suggestions.

DR. F. R. STATHERS: I move a vote of thanks be offered Dr. Haynes for this paper. Motion seconded and carried.



## PRESIDENT'S ADDRESS.\*

By L. J. Walker, D. D. S., Grafton, W. Va.

WEST VIRGINIA lies on the happiest lines of latitude and longitude that girdle the earth. It lies between the north and south. When one is in the north he sighs for the sunshine of West Virginia. When in the south he sighs for the shades of West Virginia's mountains and the music of her streams as they fall from off the rocks and sing to the river.

I sometimes think that perhaps when Adam and Eve were banished from Eden the Lord God, being loath to destroy that beauty, transferred it to West Virginia.

In this land of forests and flowers and impressive beauty I greet you, and give you welcome. If welcomes were flowers, you would all wear a blossom on your coat lapel.

If my welcome were a banquet hall, you would each partake of milk and honey—the "milk of good wishes" and the "honey of happiness"; and you would drink of the "wine of brotherly love." And that reminds me that, to the honor of our profession can it be said, we are next to preachers in sobriety—perhaps because our work compels us.

But were I a painter I would paint a picture of Jacob's ladder, and upon its shining rungs I'd paint the forms of dentists ascending and descending, making many a heart more joyous and causing many aches to flee before them.

It affords me the greatest pleasure to appear before you as president of the West Virginia State Dental Society, in which we have a justifiable pride and a "heart interest"; and I wish to express my grateful appreciation of the preferment so generously conferred by my confreres. To you who conferred this, the most decorative gift in the giving of this society, I extend my sincere thanks. Also do I so thank the secretary and various committees for the excellent work they have done in making possible this meeting.

Why are we here? One of the first questions we ask about a machine or institution or convention is: What for? Children ask it. There is common sense in it. We naturally believe there is a purpose back of everything. "What?" is a highly proper question.

Briefly stated, I think we are here to appreciate and appropriate. We gather for helpful association, for developing the fraternal spirit, good will and brotherly kindness. We come to talk about the things that make for our success. We are here to discover and dissipate our pet delusions.

Did you ever spend any time in a lunatic asylum—I mean as an observant visitor? Then you noticed that each permanent resident there has some pet delusion of his own. Sane on every other subject, but he cannot

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\*Read before the West Virginia State Dental Society, 1911.

shake off the dominance of some single wrong idea. One good fellow has the notion that he is "Captain Kidd." If you distract his attention he will talk reasonably on fifty subjects, but don't mention maritime affairs. Off will go his trolley if you mention "Captain Kidd." There's a broken-down pauper staggering under the imaginary responsibility of an enormous fortune. He thinks he is a great financier, vainly seeking rest from directors' meetings. The list is long, each with his pet delusion—sane enough on every other point.

We all are apt to grow a pet delusion and come under the domination of one more or less fool idea. Born unlucky--Fate has had it in for me since the earliest dawn of time--waited for me to be born in order to jump on me good and hard. Bad luck just won't let me catch up. That may be my pet delusion.

Some there are who think they are the busiest men in the profession. Their responsibility to their patients is of such magnitude they could not possibly attend a dental convention; that is for the mediocre. That is their pet delusion.

Others there are who think they know all there is to know of any value to the profession; graduated from the best college in the country and been at it for twenty years.

And so it goes. Most of us have our own particular weak point where our reason may jump the trolley; a private gap in the fence where our best judgment bolts like a frightened horse and runs wild. It is a good thing to take stock of ourselves once in a while; get a grip on ourselves; shake off the sprouting delusions, and drive away the haunting shadows. Let us see things as they are; get the facts, carefully scrutinize, and seek the truth.

Men congregate in social affairs because of identity of tastes. Men gather in political parties because of identity of principle. Men are bound together in secret societies because of identity of purposes. Men associate in business because of similarity of interests. We cannot live in business or in pleasure without affecting our neighbors. And this is a principle it behooves us to get in touch with. The day of the selfish man's prosperity and happiness is past.

A field of ripening grain looks beautiful in the golden pageantry of the summer sun, but the nutritious wheat heads would be of little use if left moving separately in the sun, each for itself. Only when the slender stalks are bound together do they show a purpose and fulfil a mission.

It is well that dentists should congregate; but that is not enough. They must be united in heart and mind before they can accomplish their best in life. A live dental society must be more than an association of dentists, unrelated, just congregated. That is like a pile of sand, each grain alone in its purpose, merely in contact with its neighboring grains. You cannot hurl a pile of sand anywhere. You cannot build anything upon it. It is easily scattered by wind and rain. But fuse it by fire and it becomes a real solid, compact body of matter, which, given a master mind, would

have power limited only by the faults of fusion and number of grains of sand.

Instead of the pile of sand, let us think of a pile of men — an organization of dentists, thoroughly fused by the fire of fellowship, and thoroughly organized, with all its branches functioning. Such an organization would have power for human benefaction limited only by lack of numbers and faults in the individuals. And it is of the individual dentist, who is a unit in his society (if he is a live one) that I wish to talk about, feeling that in him is the foundation for improvement. Improve the unit and we improve the mass. That in which the majority of the individuals fail, in that will their organization fail. As they succeed will the organization succeed.

Is success the result of mere luck, chance and accident; or is it the effect of a cause, the result of the operation of a law? I answer: There is no such thing as chance; everything is under some great law. All progress, physical, mental, financial and professional, is based upon law. The law of success is as much a part of the great law system as the law of gravitation. Men everywhere are taking more account of this fact every day.

He who wins success in any line does so because he has followed the laws pertaining to his profession — has done it consciously or unconsciously. He who has been unsuccessful is paying the penalty of disobedience to that law. Success is not a matter of grind and rush and fight and struggle. It is a matter of getting into harmony with and keeping in closest touch with the law of success. If you have been a natural success builder, having followed the law unconsciously, you should strive to know that law and follow it consciously.

What is success? I am not going to define; but it is a plain fact and a commendable one that we all want to achieve success. The prime object in life is, of course, happiness, and must never be lost sight of, for without happiness there is not an ideally successful life. But I have no sympathy with those idealists who say that money has nothing to do with happiness. This I believe: That it is not possible to be "broke" and happy at the same time for a period of time covering more than three meals.

In what direction lies the harbor of success? What power propels our craft? What is the chart and compass? What are we in the profession for? What working for? Do we answer, to make money? Then we are headed wrong, and our motive power is not good. Our chart and compass is out of order, and our ship will not arrive at its destination. It is not good navigation. Verily, money lies along the way toward success, but we must coal and provision and man our ship for a port farther ahead if we would be certain of reaching even the port of Money.

Let me hold my hand at arm's length and I see it very well. I can also see some of the beauty and good of the world; can see the horizon. Bring it closer, and I do not see it any better, but I shut out more of my



field of vision. Bring it very close to my eyes and everything becomes obscure.

It is possible to get so close to dollars that we can see nothing else. Among this class are those who are making sufficient for their actual needs, but are sacrificing their health and happiness for more dollars. They overreach the prime motive of men for money, which is to secure to them the joys of life. Among this class also are found the men who are afraid their colleague across the street will make a dollar. They are ready to do two dollars' worth of work for one dollar to keep the other fellow from getting that dollar. This kind of fool is rarely found outside of some profession—in the dental, mostly.

Just as foolish is he who will expend of his energy such quantity that should recompense him two dollars, for a fee of one dollar. He has broken the law that maintains the equilibrium between health, energy, education, culture, and the joy of living on the one hand, and money or anything it can purchase on the other. And all will be lost.

Even the port of Riches, with everything else sacrificed, cannot be reached in this way. Every time such an error is made our ship is deflected from her true course. Thus countless thousands are lost in the great ocean of Failure.

Others among those whose vision of the future is obscured by the dollar within immediate reach is he who does not have time to attend his society meetings. He is not helpful to his brothers, nor does he benefit by the superior knowledge that comes from collective minds. He soon wears an ever-deepening rut, out of which he does not move; and when deep enough this rut becomes a grave.

Success today calls for more and more physical vitality. We must have courage. Courage, psychologists tell us, is nothing but a plus condition of mind and body. It is superabundant vitality.

We must have enthusiasm. There can be no enthusiasm without strong pulsing of plenty of red blood in brain and arteries. We need self-confidence, persistence, determination, hope and cheerfulness.

All these are manifestations of mental power; and mental power is absolutely dependent upon and proportionate to physical health. Herein is the very foundation, the only foundation, upon which success can be built.

There is a reason why a man is a black pessimist. No man can hope to be light and buoyant in manner, or expect to carry with him an atmosphere of hope and cheer, and radiate optimism if he is experiencing the sensation of carrying a section of lead pipe in the pit of his stomach. A hollow, shrunk chest and an anaemic brain are companions, but are not found in the company of leaders.

A professional man's health is just as much his chiefest asset as the man who does manual labor. His nerve force is his bank deposit. He can draw on it just so many drafts of so much each. Nature honors no overdrafts. When the deposit is exhausted the man is out of business. He

might as well pull down the shades and lock the office door. The officials of the bank of health make no mistake in figuring. Every amount drawn is entered by a remorseless bookkeeper. The cashier warns you from time to time in sundry ways as the amount gets low. If you disobey the warning you will land in the court of physical bankruptcy.

Health means power, and power means success, if other laws are regarded. The man with the greatest vitality wins; is ready and able to grasp an opportunity, and profits thereby; just as the man with a bank account, plus that for living necessities, is able to handle a deal for large profit that the man of small bank account must not undertake because he has not the stored money power.

Any great human achievement must be backed by physical health. Yet many a professional man would be ashamed to treat a second-hand lawn mower with as little consideration as he gives the delicate mechanism of his own body.

We are busy men; I know that. There is such a list of things requiring attention every day! It is not work that wears out a man. He will stand a surprising amount of it if his mind is kept clear. But we must not allow our work to become a monotonous grind. We must alternate our work with some pleasurable diversion each day, lest the mind and nerves tire when we worry; and they who live in a worry invite death to hurry. We are most easily annoyed when our nerves are at high tension. Such annoyance is a warning from the cashier; and when you feel like Bill Barlow says of the mummy, that "It ain't had no fun for more'n four thousand years," you are due for a vacation; and don't miss taking it if business has to go hang, which it won't, but will if you don't. It is a crime as well as a folly to concentrate upon work when such concentration results in mental, moral and physical stagnation.

The man whose physical forces are at low ebb is lessened in reliability. His earnestness wavers. His sense of justice, honesty and courage is dulled; kindness and loyalty droop; hope and faith grow dimmer. A weakened body also means a weakening of decision and action. Even if his will be strong he lacks endurance to stay.

We have the strongest kind of concrete example of the dependence of increased mental capacity, endurance and sense of honor on improved health conditions in the recently famous "Marion School Dental Squad." All the members of this class would have been considered healthy by the casual observer. They were all attending to their studies and their play. They represented the average health conditions as found in any school. Hygienic conditions were improved only as pertains to the mouth and proper mastication; yet the health plus condition resulting from this alone resulted in a plus mental capacity and endurance of 99.8%. This was the average in a class of twenty-seven boys and girls. In one case it was over 400%. In another case a girl made a lost promotion and the promotion due, in one term, while handicapped by circumstances that prevented school attendance the greater portion of the time, and necessitated hard

manual labor for a child. In another case it showed an improvement in deportment from incorrigibility to docility and trust worthiness. At the National Dental Association I saw this class and heard the evidence that convinced me of its truth.

What is accomplished by oral hygiene is via health. If on health plus depend energy plus, courage plus, justice plus, endurance plus, it follows that on health plus depends the ideal man or his approximation as a citizen, or as a unit in any organization, professional or otherwise.

Numerous additional essentials there are for success, but even their stability rests upon health as the foundation.

Relaxation is our chance to remove the "weight of the burdens" and gain the momentum which is to carry us further along. Without this momentum we stall on the difficulties others surmount, and we call them *lucky*.

Without recreation, creation is very limited. Of course we all recreate as we go along, but the busy dentist must be ever watchful lest his reserve force become gradually less and less, until he finds himself no longer able to maintain his place in the race. No longer capable to do his work easily, his duties become irksome, and to move progressively becomes a dull, hard grind. Then endurance becomes impossible, and failure follows.

When recreation is spoken of we are apt to think of physical exercise. That is well and good. It is the best way to divert the mind, besides making for good circulation, strong muscles, increased lung capacity, and red blood corpuscles. But divorce your idea of recreation from the altogether physical. Its greatest and most important effect is mental. Whatever is done, if it does not so clarify your mind that when you work it is alert, your thoughts concentrated, your judgment precise and your work agreeable, it falls short.

To recreate is not only our privilege; it is our duty towards ourselves and those whom we serve. To recreate rightly means to think and do the things that will bring a variety in our thoughts and actions. Someone has said, "Variety is the spice of life." That is good as far as it goes, but goes not far enough. Variety is life. The more we vary our thoughts and actions, and the oftener, the more we live.

Dentists should be interested in a number of mental and physical activities besides their professional work.

Last but not least in importance is the proper amount of mental and physical inactivity—rest. Each day put your mind and body in easy working order before you go to your work. Fit yourself for it. Take care of your health first, and your health will take care of you.

Don't be a slave to dentistry. Be its master. Make it subservient to your life. Tax it sufficiently to feed you, shelter you, and give you the accoutrements of culture. So direct it that it allows you time and capacity to enjoy the things in life that differentiate between life and mere existence. And honor it in a manner that will bring honor to yourself, your posterity and your profession.



## CARRY THE WAR INTO EGYPT\*

By Dr. J. L. Mewborn, Memphis, Tenn.

**A**S YOU predicted, Mr. Editor, we did have a good meeting at Old Point Comfort,\*\* but the question of greater importance to the profession and the public than any brought before that body was passed over with the greatest indifference, not even eliciting a word of comment or discussion. I allude to the memorial from the Alabama Dental Association, presented by their special delegate, Dr. Dunlap. Wonderful to tell, no storm of applause greeted the Alabama resolutions. No expression of sentiment or opinion was obtained. No committee was appointed to confer with the doctor as to the best means to accomplish the great results contemplated by his mission. To add embarrassment to his disappointment, just at that time all the big talkers seemed to be thinking of something else, and the whole convention hung fire. For want of something better to say, and as a means of disposing of the paper, some member did have the presence of mind to move that it be received and laid over for a year, which was carried.

Now that the paper is the property of the Southern, what are we going to do about it? March up to Louisville next August without any committee's report to act upon, and simply let it stand recorded in our last minutes, never to be called up for future action? I hope not. As editor of our favorite journal, we hope you will invite a free discussion of the subject in its columns. As president of the Southern Dental Association, we hope to see you organize and put in practical operation the grandest scheme in aid of dental education ever yet conceived.

Dental education as proposed by the Alabama resolutions has been a pet theory of mine for years, and I am proud that my native state has first given it practical form. I hold that the education of dentists and dental education are not interchangeable terms. The theory of educating a few, to the exclusion of the world besides, is the policy of bigots, which has hung over us, like an incubus, too long already, impeding our progress.

We need reform; and I agree with Alabama and Dr. Dunlap that the time has now come. But in this great movement we need not expect aid from the high church stickler to the code of ethics who sneers at anything that might appear unprofessional in the eyes of the M. D.'s and who boasts himself upon the high dais of professional dignity, and arrogates to himself alone the prerogative to deal out to his patrons such crumbs of information as he may see fit to bestow. We cannot rely upon the educated but crowded dentist to teach, much less impress, the necessity of early attention to the teeth at the operating chair; when it requires the united

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\*Written by Dr. Mewborn twenty-five years ago and published in the *Southern Dental Journal* in 1887.

\*\*This meeting was August 30 to September 3, 1887.

strength and eloquence of mother, nurse, and next door neighbor, backed with promises of presents enough to stock a toy shop, to get frightened Johnnie into his presence and have a tooth removed that he could have pushed out with his tongue; or when the stalwart man, after suffering days and nights, unable to work, or think, or eat, or drink, or sleep, from sheer exhaustion is, at last, driven to the dentist for relief. The scene is a familiar one, as he takes the chair with hands convulsively gripped, feet well braced, and every muscular fibre to fullest tension drawn, as if to meet the crash of worlds! At every sweep of the bright steel excavator, tearing thousands of quivering nerve fibrils from every tubuli, great beads of perspiration ooze from every pore, his blood is chilled, his marrow freezes in his bones, and he groans in mortal agony, as if soul and body are being torn asunder. Under these conditions of mind and body, can we expect such instructions to be received as anything but mockery?

The public are growing eager for more light on these subjects, but not under such circumstances. See how they devour Mrs. M. W. J.'s book in the waiting room and wonder why it cannot be found in the book stores. But the doors of our lecture halls are closed against them; our text-books and periodicals never fall into their hands; not even a dental primer, containing the most rudimentary knowledge of the dental organism, which all are supposed to possess, is found in our schools; not a manual of dental hygiene and prophylaxis, dedicated to the mother and placed in every household, containing for her daily needs a thousand things necessary for her to know, while fixing the stamp upon future generations and moulding habits of care, and that eternal vigilance which are more necessary than our skill for the preservation of these organs. In the years of infancy and childhood, when faith is implicit and impressions lasting, we lose our golden opportunity and leave our best interests in the hands of the wicked nurse and silly mother, who frighten the timid child into obedience with threats of the dentist and his tooth pullers.

The traditional dentist has always been a favorite theme for caricature, which has naturally engendered prejudice and distrust in the minds of the people, thereby creating a great chasm between them and us. Time has accomplished much for us in the last fifty years, but life is too short to wait for her humanizing and civilizing influences to bridge over this chasm for us. We have been pegging away at the tail end of our business long enough. We wait for the micrococci, bacilli, leptothrix buccalis, malaria, pyorrhea alveolaris chemical erosion, dyspepsia, syphilitic, scorbutic and mercurial heredity to get their work in ahead of us. All these enemies and agencies are playing havoc with the dental organisms of the human race. We step in after their feast, waste our energies and bankrupt our resources plastering up the detritus, which is all they leave to our monumental skill, and after reviewing the results of our most brilliant efforts are almost ready to cry out in disgust, "What's the use?" Let us now change our tactics and meet the enemy at the threshold of dental

life, instead of its funeral, and, by fortifying every avenue of approach, anticipate and defeat every mode of attack.

This theory requires the co-operation of our patrons. To obtain co-operation we must educate the people; to educate the people we must adopt the plan proposed by the Alabama resolutions by putting one of our best men in the field, to show them that we are terribly in earnest for their good.

Such men as Stockton of New Jersey, or Morgan of Nashville, sent out as missionaries to the people, would accomplish more good in a few years than all that has ever been said or written on dental education. With dental text-books, simplified for the masses, introduced and taught in all of our schools and class drill in the proper use of the tooth brush, tooth-pick and mouth mirror, and their compulsory use, we would soon have a nation competent to appreciate our skill and willing to compensate our services. Quacks would starve, examining boards would be abolished, and our dental laws declared inoperative and void. Books similar to "Mrs. M. W. J.'s Letters from a Mother to a Mother" would be indispensable in every household, and neither family physician nor family dentist would be compromised by consultation.

But in this mission of mercy and reform there is a class in our own ranks whom we could not afford to overlook—the class who never attend dental associations, who never read a text-book or journal, who never exchange social or professional visits, nor interchange ideas on difficult cases in practice; who do not know how to apply the rubber dam, the clamp, the matrix, the separator; nor how to band a Logan crown, to set a bridge piece, to treat acute or chronic alveolar abscesses. If this inviting field is open to you, Mr. Editor, the harvest certainly is ripe, why is red tape delay necessary? All the state meetings will be held before that of the Southern next August, at which time the Alabama resolutions will have laid over one year. Cannot a call for a committee of one from each state be made, each member to be chosen by his State Society at its annual meeting next spring? This to be a committee on constitution and by-laws, to meet at Louisville the day before the Southern next August, to formulate amendments to our constitution and by-laws, creating the office of "Senior Grand Censor and Lecturer," to be elected at each annual meeting, with ample provision for salary, expenses, equipment, duties, etc., etc. Let the incumbent be chosen for his personal magnetism and known ability as an operator, a talker and organizer.

Let his mission be two-fold—censor to the profession and missionary to the people. Let him hunt up every dentist, wherever he goes, and hold an experience meeting with him. In this way a great deal of valuable statistics could be gathered. If he finds him in the old ruts, pull him out, shake him up, demonstrate to him the new things and modes, infuse new zeal, show him great possibilities, that he may become an ornament and not a reproach to his profession. Let this censor enlist the co-operation of legislators and educators in an effort to introduce into all our public and



private schools graded manuals on dental hygiene and prophylaxis, and to assemble children and parents and teach them dental physiology and pathology and urge the important fact that constant care, perfect cleanliness and prompt attention on their part are more necessary than the skill of the dentist to preserve these jewels, whose neglect entails so much suffering and whose loss is irreparable.

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### NITROUS OXIDE ANESTHESIA.\*

By W. I. Jones, D.D.S., Columbus, Ohio.

I SHALL NOT attempt in this paper to burden you with the history of nitrous oxide nor to lead you through the different stages of the development of nitrous oxide anesthesia. Suffice it to say that for more years than any other anesthetic agent has nitrous oxide engaged the attention of scientists, and today greater interest is aroused in its development than ever before. Indeed, I believe the day is not far distant when nitrous oxide, combined with oxygen, will be the anesthetic of choice in nearly all surgical operations. It only remains for the somewhat elaborate technique of its administration to be simplified to hasten the coming of that day.

For many years the use of nitrous oxide has been limited to surgical operations not requiring over a minute or two for performance. This was owing to unreliable methods of experimentation, the wrong kind of apparatus for its administration, and a wrong conception of its physiological action. Two theories were early advanced as to how it produced anesthesia. The first taught that anesthesia was produced by hyperoxidation. This we now know to be wrong, because the nitrous oxide is not broken up into its original elements when absorbed by the blood, but when taken into the circulation it is inhaled as nitrous oxide and exhaled absolutely unchanged. So their theory of hyperoxidation, you see, is clearly untenable.

You will no doubt understand that, but I will make it plainer. If I were to inhale nitrous oxide and exhale it again, and these exhalations were caught and given to our president here, those exhalations would anesthetize him; and so on; you keep on repeating it, because the nitrous oxide isn't broken up into its original elements. That would be one proof. There have been a number of proofs made. One is that we know it requires a high heat to break it up into its original elements.

The other theory taught the deoxidation of the blood—that was directly opposed to the other. One theory taught the hyperoxidation; the other the deoxidation of the blood. This last theory was even more dangerous than the first, as it was believed that asphyxia was necessary before anesthesia could be produced; but this oxygen starvation theory is also wrong. The classical experiments of Paul Burt, the French physiologist, proved this, and we who are practicing anesthetics are demonstrating clinically every day the error of this theory.

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\*Read before the West Virginia State Dental Society, 1911.

Now, it is upon the correct and clear understanding of this last false theory that one's success as a nitrous oxide and oxygen anesthetist depends—this false theory of deoxidation. You may believe almost anything else you want to about the physiological action of nitrous oxide, because no one knows just exactly how anesthesia is induced; no one can tell you that. We simply know that when any anesthetic is inhaled it is taken up by the alveoli of the lungs; there it comes in contact with the blood and is absorbed by the blood, and at last is taken up by the lymph and attacks the nerve terminals and finally the nerve centers in the brain and along the spinal cord. But you must know how to produce a prolonged anesthesia, free from muscular spasm and as smooth and tranquil as that produced by any other anesthetic, and without their objections, cyanosis or other evidences of asphyxia, because it is possible to produce a beautiful anesthesia without any of these symptoms, and the moment they appear that marks the beginning of the end of proper anesthesia, unless steps are immediately taken to establish a pink circulation. However, the respiration is not always the first to be over-anesthetized. I have seen cases wherein it seemed the heart was slowed before cyanosis appeared, but I believe that in the great majority of cases the respiratory center is the first to succumb. There are some men who say that the heart is the key to the situation. I really cannot accept that altogether. I have seen cases where it seemed to me that the heart was affected along with the respiratory centers synchronously—that is, you knew by the condition in your patient that the heart-beat was slow and the heart was irregular; but I believe that in the great majority of cases, as I have said, the respiratory center is the first to succumb, and that in cases where symptoms of circular depression arise they occur as a sequel of faulty respiration. These are conclusions I have arrived at after a large clinical experience in all sorts of surgical operations and upon all sorts and conditions of people. The remedy for these phenomena of danger is oxygen, which you should always have ready.

**THE TECHNIQUE:** It is assumed that there is no doubt in your minds that nitrous oxide and oxygen is the best anesthetic, when properly administered; but the question also in your minds is how to get a satisfactory anesthesia, a method for which I shall now endeavor to explain.

The first and most important thing, regardless of what apparatus you use, is to have a continuous and even flow of both the nitrous oxide and oxygen under positive pressure. This I obtain by manufacturing my own gas and storing it in a large gasometer, and the use of the large cylinders with pressure regulating valves manufactured by the Ohio Chemical Manufacturing Company.

Second, use warm gases, as less time and gas is used; a more tranquil anesthesia is induced, and there will be no post operative bronchitis or pneumonia.

And, lastly, maintain the depth and character of the anesthesia by the amount of oxygen mixed with the nitrous oxide, and not by turning off and on the nitrous oxide.

There are three principles, you see. I hope you got them. I will read them over again, because that is the quintessence—that is the secret of the whole thing.

Always have a continuous and even flow of nitrous oxide and oxygen; and the way to do so is by first manufacturing your own nitrous oxide and storing in a large gasometer. If you do not want to go to that expense, then use large cylinders. They are just out, which shows that the manufacturer is on the right track. They have pressure regulating valves in these cylinders, and you get an even flow and a positive pressure. That is the first thing—an even positive pressure and an even flow.

Second, use warm gas, for these reasons: Less time and gas are used. I haven't it in my paper, but an anesthetic lasting one hour using cold gas, you will consume about 250 gallons of nitrous oxide and forty to fifty gallons of oxygen. If the gas is warm you would use 100 gallons less. That is important; it is always important. The less anesthetic agent, no matter what it is, the better off the patient is; and of course you save money by it also, and that is important to dentists.

And, lastly, maintain the depth and character of the anesthesia by the amount of oxygen mixed with the nitrous oxide, and not by turning off and on the nitrous oxide.

These three principles, rightly understood, make possible prolonged anesthesia under nitrous oxide and oxygen—a thing, I grant you, much easier said than done; but when it becomes generally understood by the dental and medical professions that patients recover from the anesthetic immediately, and quite regardless of the length of time of the anesthesia, without nausea and with no after effect either upon the lungs, kidneys or any other part of the body, then those anesthetists who are interested in the welfare of their patients will agree that it is well worth the study and time it takes to master its details.

#### DISCUSSION

DR. C. H. NEIL, Fairmont, W. Va.: Mr. President, Ladies and Gentlemen: I did not know that I was on for the discussion of this paper until I saw my name on the program, and inasmuch as I had not seen the paper before it was read this evening, and having had very little experience with the use of nitrous oxide and oxygen, I will not attempt to make any discussion or enter into criticism. But from the limited experience I have had with nitrous oxide and oxygen, I have never yet seen an administration or demonstration in which complete anesthesia was obtained without cyanosis. The doctor states that no complete anesthesia is perfect with the presence of cyanosis; and the doctor further states that cyanosis is due to faulty respiratory action. I do not understand that, if the faulty respiratory action should cause cyanosis. That is the only thing I can see in the paper at all that is not quite clear. I am very poorly equipped to discuss such a paper, and I only wish I had seen it before the reading came up.

DR. M. B. WEST, Parsons, W. Va.: I just want to ask a question. I believe Dr. Jones said that in nearly all cases—probably all cases—that he had noticed, where it was perceptible to notice, a slowing of the heart beat before cyanosis appeared. Isn't that a little out of the ordinary? I do not understand why that should be.



DR. F. L. WRIGHT, Wheeling, W. Va.: I do not know anything about nitrous oxide and oxygen, although I use nitrous oxide a good deal. I have thought of taking it up, and from the reports I have heard it is a very important step, and I do not think it is one that any one of us can afford to pass by, especially in the preparing of roots and minor operations around the mouth to avoid pain, and I, for one, am going to take it up myself just as soon as I can get around to it. I should like to hear from some of the others here; they know something about it. Dr. McClure:

DR. JOHN H. MCCLURE, Wheeling: Dr. Wright made a mistake when he called on me. Sometimes he is right (Wright) and sometimes he isn't right (Wright). (Laughter.) I do not know anything about it whatever. I do believe, however, that it is a very important thing. I do believe that it is the coming anesthetic. I have given nitrous oxide for many years—I have not lately, but I did for many years—nitrous oxide in its purity. I have used it with chloroform, and I do not believe there has anything like it ever been discovered yet. I do not believe somnoform is in the same class, when your pipes do not leak; that is the main thing. But I believe the mixture that works with it, oxygen, is the coming anesthetic; I have thought so for a long time. That is one of the main reasons why Dr. Jones was asked to give the paper.

I think Dr. Jones' paper is as concise and clean a piece of literary work as we have had in this society since it was started. Brevity is the soul of wit. The paper was not as long as some people's sometimes are, but it certainly shows how to administer nitrous oxide and oxygen, and I hope this Clarksburg delegation is going to have a patient we can try it on, and I think there will be a lot of people before the next meeting who will use nitrous oxide and oxygen if they try it out under proper conditions.

PRESIDENT WALKER: I have no doubt you are all very much interested in this paper, and while you probably know something about nitrous oxide and oxygen, you do not seem to want to discuss the matter. I have no doubt you have questions you would like to ask and which Dr. Jones would be glad to answer. I wish you would not be slow to ask.

DR. H. H. HARRISON: I wish to say a word. I believe with Dr. Jones that it is the best anesthetic in existence today. I believe it from theory and I believe it from practice. Those are the two ways of obtaining any absolute fact. His explanation of the technique and the principles by which anesthesia is produced were very good. I have taken it myself for a surgical operation, and I want to say to you that when I came out from it I was just as clear in my mind as I am now (if not clearer) in less than two minutes after it was taken away from my face. I did not experience any pain. I do not know as to the condition of the face, but I am satisfied that he is correct about the principle of anesthesia, that the face should be the absolute determining point with respect to the true and absolute effect of the production of anesthesia. I do not believe anybody will be in a proper condition of anesthesia after cyanosis has set in; I think that is a false idea.

With respect to the absolute physiological principles that enter into anesthesia, as Dr. Jones says, I don't believe anybody knows what they are. I have my own theory, and it differs a little from Dr. Jones'. He is probably correct, but I want to say that, in the first place, there are said to be 300,000,000 nerve cells in the human brain. The atmosphere taken into the body laden with oxygen produces a purity in the blood that keeps these vessels in the brain in a perfect state. Now, if these cells in the brain are kept in that perfect state of health and purity and effectiveness, the oxygen that is taken into the body through the lungs passes into the blood going to the brain; why not the same process in the way of an anesthetic given in the same way, passing through the circulation into the nerve cells and the brain, and there producing that effect of anesthesia? That is the solid principle of the whole business, to my notion.

DR. I. W. HUTCHINSON, Parkersburg: I want to thank Dr. Jones for this paper. I haven't anything to say except that I have given nitrous oxide for fifteen or eighteen

years myself, but here just recently I have discontinued giving it. I have been thinking very seriously of taking up this very work myself, for various reasons. I believe it is feasible and a good thing.

DR. FRANK L. WRIGHT, Wheeling: This society is under obligations to the Ohio Chemical Company for this gas apparatus which they very kindly consented to ship to us and which is now in the basement ready to be set up here, and Dr. Jones will give us a demonstration tomorrow on a patient. Dr. Hall has just suggested to me that if you can find a patient with a surgical cavity, Dr. Jones will give him the anesthetic and prepare that cavity painlessly, and give Dr. Hall the chance of demonstrating his method of making amalgam models—kill two birds with one stone. I am very anxious myself to see the demonstration of the first stage or deep anesthesia for the crowning of broken-down roots, etc., painlessly. I have seen complete anesthesia at Cleveland, and it was very successful.

DR. JONES: I was in hopes I would create a lively discussion here. I read a paper before the Medical Society some time ago, and I had the pleasure of stirring things very considerably.

I will try to answer the questions in the order in which they have come up. Dr. Neil spoke of asphyxia. I believe he said that I said that asphyxia was necessary—

DR. C. H. NEIL: I think you stated that cyanosis was due to faulty respiratory action. In giving chloroform it is due to faulty heart action.

DR. JONES: This cyanosis and the darkening of the blood is caused by deoxidation of the blood. That is, when the lips begin to turn dark in color then you know the patient is not receiving the proper amount of oxygen. It is the great clarifier, and by the administration of oxygen you clear up the blood. While cyanosis is an evil sign, it is easily noticed because it comes on so quickly and is quickly dispelled. Cyanosis is not necessary.

I believe Dr. West misunderstood me. He speaks about the slowing of the heart.

DR. M. P. WEST: I understood you to say that in complete anesthesia the heart slowed previous to or before the respiratory action.

DR. JONES: Some men say that the heart is the key to the situation, and one man has devised a scheme for continuous oscillation. I have used a tube, a stethoscope, over the heart of the patient in major surgical operations and listened, and when the heart begins to slow it is said that it is a sign of respiratory failure. But not all anesthesiologists are ready to receive that. I am not.

DR. H. H. HARRISON: Would not the addition of oxygen relieve that entirely?

DR. JONES: That is the cure, but you want to be on the lookout for those danger signs long before that.

Dr. Wright speaks of its use in minor operations, and I want to say that while I advise it, you will find it rather difficult to administer. We are going to show how to administer it in any kind of a case you can bring up, but I wish to say this, that it is much easier to administer nitrous oxide and oxygen in a major surgical operation, where you can use a face inhaler, than it is to use it in dental, or mouth, nose and throat operations. I would much rather give it for an operation lasting an hour for the removal of tumors, etc., than for an oral operation, for this reason: In administering nitrous oxide mixed with oxygen, if you are using a nasal inhaler your patient's mouth is open, and the least little thing is liable to disturb the rhythm of his breathing and he will go to breathing through his mouth. Then you have to close the mouth and force breathing through the nose. With the face inhaler you do not have to contend with that at all. It is much easier, compared with the nasal inhaler operation. You will get the idea in this: We will say we are using a combination of nitrous oxide and oxygen, and let the mixture represent 100 per cent. You always have to have at least 80 per cent nitrous oxide or you never can produce anesthesia. Suppose now we do not

use oxygen; suppose we introduce atmospheric air 20 per cent—80 per cent nitrous oxide, 20 per cent of atmospheric air. Four-fifths of atmospheric air is nitrogen; you have only 4 per cent of oxygen in that mixture. You are filling up the alveoli of the lungs with the inert substance, nitrogen, that is having no effect whatever; simply blocking up the lungs, where they might be used for something much better. So that the use of the face piece for major operations is an easier operation than the use of the nasal inhaler.

DR. McCURE: I want to thank Dr. Jones for the beautiful bouquet he handed me. The doctor says he has used it in a great many cases, just the pure nitrous oxide. Pure nitrous oxide and nitrous oxide and oxygen are entirely different propositions. When you use nitrous oxide you are using an asphyxiating agent, pure and simple, because in those days when a man used nitrous oxide he simply put the face inhaler over his patient's mouth and proceeded to knock him out; and when a muscular spasm appeared and his breath came in gasps he knew it was time to stop. Now, when using nitrous oxide and oxygen, that makes a true anesthetic, and you regulate your anesthesia by mixing nitrous oxide with the oxygen.

DR. JONES: Dr. Harrison speaks from experience. He tells us he had an operation performed and came out of it feeling excellent. I have administered it in operations lasting one and a half to two hours, and the patient would recover and in two or three minutes would be able to converse and would not suffer any nausea, and without any liver or kidney trouble.

Dr. Geo. W. Crile, of Cleveland, one of the greatest authorities on anesthetics and a man who speaks from knowledge, says that ether anesthesia produces refrigeration of the kidneys—that is, the ether is absorbed by the kidneys. It causes suppression of urine and there is a sloughing of kidney tissue. None of those things can occur in the use of nitrous oxide and oxygen because they are inhaled as such and exhaled as such, and the patient is over it inside of two or three minutes.

Dr. Wright spoke about the deep anesthesia, the first stage. Really there are not any stages in nitrous oxide. You have three stages in ether; but with nitrous oxide the patient runs the whole gamut from analgesia to complete anesthesia in less than two minutes. The stages merge from one to the other so quickly that you cannot discover them. The anesthesia that would be produced for such operations as the excavation of a cavity is simply analgesia—that is, the sensation in the nerve terminals is suspended, but the patient is conscious of what is going on. The reason for that is that the anesthetic agent is first taken into the alveoli of the lungs and carried to the nerve terminals. You feel the anesthetic in your fingers and toes before you do any other place. That means the anesthetic is affecting the nerve terminals, and you have analgesia. After it is carried further it affects the nerve centers, and you have deep anesthesia.

DR. E. E. HALL, Columbus, O.: I would like to ask Dr. Jones to make it perfectly clear in his clinic tomorrow in regard to the use of the nose piece. He says that you have to contend with mouth-breathing. Don't you overcome that to some extent by increasing the pressure of the anesthetic through the nose, so that you overcome, to the greatest extent, breathing through the mouth? In other words, you flood the nasal cavity and the mouth with the anesthetic by increasing the pressure of it, and in that way make it impossible to take any considerable quantity of air. Isn't that your experience?

DR. JONES: Yes.

DR. HALL: To my mind that is one of the important things in connection with the use of the mouth piece.

DR. JONES: That is important. In using a face piece—you know the apparatus; I do not care what you use; there are a great many makes—a face inhaler covers the face and the mouth. Then there is a nasal inhaler that we use in dental and mouth, nose and throat operations. I say it requires more skill to use that than it



does the face inhaler, for this reason: I shall try to demonstrate that. Suppose, now, you have a patient who is nervous and timid and liable to cut up at the slightest provocation. You place him in the chair and fix the nasal inhaler, and you explain: "Now breathe through your nose in a perfectly normal way." He does that for two or three inhalations; then something disturbs him. Maybe he thinks you are going to begin before he is asleep, or he hears a noise. While he has been breathing through his nose (Dr. Jones illustrates) in a perfectly normal way he drops his mouth open and begins breathing through the mouth (illustrating). That defeats the very thing you are trying to get, because he takes with each inhalation of nitrous oxide through the nose a deep breath of atmospheric air, and this air neutralizes the nitrous oxide. Now, the way to overcome that is as follows: On the nasal inhaler there is a little notch, and you loosen that and drop the plunger and turn on the gas harder, and that forces the gas through the nose into the back part of the pharynx and into the lungs, and the gas wins out if the pressure is sufficient. Another way to assist you, is always try to have your patients breathe calmly and quietly through the nose in the normal way, and then when you think they are asleep open the mouth and pack the back part of the mouth and the pharynx with some sterilized gauze or cotton; pack that and shut off the pharynx from the oral cavity, and it is an aid to you in preventing blood or pus or pieces of teeth or anything that is there falling into the pharynx, and also prevents air from being inhaled through the mouth. With the face piece you do not have that to contend with, because mouth and face are completely covered and you regulate anesthesia by the oxygen.

DR. MCCLURE: Could you administer through the face piece and then change to the nasal?

DR. JONES: You could, but I have never found it necessary. I would like to explain a case I had the other day. This man came into my office and we placed him in the chair. When he was prepared ready for operating, I began with the nasal inhaler, and I thought he was simply going to eat up all the oxygen and gas I had. I managed to get out a couple of teeth for him (he had a number of them), and then I took off my nasal inhaler and was going to use the face piece because I couldn't get control of him with the nasal inhaler. I could by keeping at it, but I was told he was a poor man and I was not charging him very much, and I saw he was going to cost me more than any other man in town, and I used a face inhaler with chloroform mixed with it; and that didn't do him any good. I asked him how much dope he had taken before he came in and his wife said she didn't think he had taken any. Then I gave him a hypodermic injection of morphine. And just at that time a friend of mine came in, and the man had gone to the lavatory. He looked like a dope fiend, and dope fiends are always hard to control; you don't know why; because their nervous system is so used to it, I suppose. And after he came back I gave him a hypodermic injection of morphine, one-eighth of a grain, allowed him to wait for twenty minutes, and then anesthetized him without trouble. That is the routine practice with me in hospital work. I use from an eighth to one-quarter grain of morphine with 100 of atropine probably one-half hour before the operation, when I use ether. It is a good practice to use it when you use nitrous oxide. I do it when I feel that the case demands it.

PRESIDENT WALKER: I am sure we are indebted to Dr. Jones for this paper, and tomorrow morning he will give us something very interesting. You will all give him your attention, I hope.

**It's jest as cheap and easy to rejoice;  
When God sorts out the weather and sends rain,  
Why, rain's my choice.**

*—James Whitcomb Riley.*

## PYORRHEA ALVEOLARIS\*

By James H. Kelsey, D.D.S., Erie, Pa.

SO MANY VERY excellent papers have been written of late on Pyorrhea Alveolaris, and it has been so extensively discussed, that I hesitate to present this compilation of the writings of other and more competent men. However, I so firmly believe in the great importance of this subject that even a reiteration may help to impress its importance upon the minds of some who may perchance treat the subject lightly.

Pyorrhea is not, by any means, a subject to be treated in a hit-or-miss, haphazard manner. It is a foe worthy of the steel of a valiant aggressor. Its conquest requires care, concentration, a steady hand, a keen sense of touch, and sound judgment.

With these facts before us, we shall take up a general consideration of the disease, touching upon the etiology, diagnosis, and general treatment.

Before proceeding, I would like to mention how much I am indebted to my esteemed friend and instructor, Dr. D. D. Smith of Philadelphia, with whom I had the extreme honor and pleasure of spending upwards of a month, studying in his office this subject, and oral prophylaxis, and receiving invaluable help. Dr. Smith is a man truly devoted to the interests of our profession and one to whom we owe untold gratitude. He is the originator of Oral Prophylaxis treatment and the inventor of a set of most useful instruments for the treatment of mouth pyorrhea, which he consistently regards as mouth inflammation.

## NOMENCLATURE

It might be well at this moment to say a few words in reference to the nomenclature of this disease. I feel called upon to stick to the term "Pyorrhea Alveolaris" from what might be termed public sentiment. Most of our patients know, in a vague way, what Pyorrhea is, and in spite of appeals of the men most versed in nomenclature of this disease, the popular term with a majority of our profession seems to be "Pyorrhea Alveolaris." There surely ought to be a more technically correct term which could be universally adopted, but until there is let us accept the common term of "Pyorrhea Alveolaris."

Dr. Hoff names the disease "Peridentitis," Dr. Fletcher calls it "Alveolitis," and each has almost conclusive arguments that his term is the nearer correct, but neither term seems to be entirely complete; so, for the sake of peace, let us revert to the prosaic "Pyorrhea Alveolaris" and take the consequences. Be it what it may—Pyorrhea, Pyorrhea Alveolaris, Riggs Disease, Alveolitis, Phagedenic Pericementitis, Interstitial Gingivitis or Peridentitis—the conditions remain the same and we must, one way or another, combat them. The name is really of minor importance, the treatment being the same in all cases.

\*Read before the Lake Erie Dental Society.

I feel, however, that the various stages of the disease should be designated in some way. In this respect, I think that Dr. M. H. Fletcher's subdivisions are most suitable, namely: Primary, Chronic, Suppurative, and Necrotic. These will be described under the heading of "Diagnosis," for at this period it seems advisable to discuss the etiology of Pyorrhea.

#### ETIOLOGY

Opinion has been unevenly divided as to whether local or constitutional conditions cause Pyorrhea, with the odds greatly in favor of the former. Indeed, so large a majority of eminent Pyorrhea authorities of today scoff at the mere mention of systemic conditions being responsible for mouth Pyorrhea that their arguments, taken together with several self-evident facts which will be discussed in their order, convince one that the disease is of purely local origin. Of course I grant that in patients of certain temperaments and some of continually poor health, Pyorrhea is more prevalent than in perfectly healthy people, not because of any constitutional cause but because the tissues are more susceptible to this or any other disease than in one of robust health. This may be well explained by the greatly lessened vitality of the patient and the lessened power of resistance of the tissues to the ravages of any disease, be it Pyorrhea, canker sores, abscesses, necrotic conditions, or what not. Pyorrhea may exist in persons who have not a particle of uric acid in their systems. In fact, it seems to me that a large proportion of Pyorrhea patients have no uric acid tendencies. In many cases the patient is otherwise in most robust health, even escaping the toxic effect usually present in Pyorrhea patients. One will also note, in most cases of supposed constitutional causes, that at some period in the patient's history he has been very negligent in the daily care of his teeth, and is so even at the time of his application for relief, or he has perhaps been receiving treatment from a dentist notoriously careless in this matter. In either of these cases, Pyorrhea could have been prevented by prophylaxis, if such treatment had been instituted prior to any pyorrhetic symptoms, and may be cured if such treatment is persisted in.

Taking it for granted, then, that Pyorrhea is of local origin, we can now consider more intelligently the more immediate causes. These may be divided, in the order of their importance, as follows:

- (1) Deposits of various kinds;
- (2) Faulty dental operations;
- (3) Imperfections of the dental arches.

As the first is most important and will require the most discussion, let us dispose of the third division first.

#### IMPERFECTIONS OF THE DENTAL ARCHES

In considering imperfections of the dental arches a multitude of important points might be cited, but time forbids, so we shall mention a few only of the more typical conditions, which all of you will recognize as being frequent in any dental practice.



For better consideration, I shall subdivide this classification as follows:

- (1) Irregular arches;
- (2) Irregular teeth;
- (3) Nonocclusion;
- (4) Malformed teeth;
- (5) Malocclusion.

The first item of this subdivision will recall to your minds the innumerable cases where the arches are so abnormally shaped that it would seem impossible for the patient to establish absolute oral cleanliness, as for example, cases where all the lower teeth incline lingually, especially the anterior six; where the arches are constricted, and so forth. In time, if not properly cared for by the patient and dentist, deposits are bound to occur, with ultimate disastrous results.

Where there are irregular teeth the same is true: debris gathers and decomposes, inflammation sets in, gums are forced away, deposits accumulate and extend down the side of the root, until we have a case of Pyorrhea well under way.

In cases where there is non-occlusion, especially where teeth stand alone, also when upper third molars project towards the cheek, Pyorrhea finds a ready foothold, and these cases are very hard to treat successfully.

In malformed teeth I shall cite only one typical condition, and that a very important one, namely, where there are those abnormally large teeth with thick, bulging, bell-like crowns and small necks. These teeth seem to be particularly susceptible to Pyorrhea, while, strange to say, caries are seldom present. They are very hard to keep clean and tartar readily forms, also that gelatinous, highly infected, transparent, mucous coating which clings to the teeth so tightly.

Malocclusion is the greatest bugbear of this classification. In cases of undue lateral stress against malformed and irregular teeth there is great havoc wrought: like the constant dropping of water which wears away the hardest stone, so does the constant hammering and heavy pressure of mastication at this one point gradually loosen even the firmest tooth: deposits will then soon form and progress deeper and deeper until a full-fledged case of Pyorrhea is developed. Impacted third molars are responsible for much Pyorrhea; the reason is too obvious to discuss further.

One very frequent and usually avoidable cause of pyorrhea is the early extraction of six-year molars. This is only another serious result of the wanton sacrifice of these teeth. Gentlemen, it surely is a serious mistake for any dentist to extract six-year molars except under clearly extenuating circumstances. These teeth, extracted from, say eight to twelve years of age, before complete eruption of the second molars, will usually result in the second molars leaning into the space left by the extraction. Then when the third molars erupt they still further force this second molar to tilt into the space left, thereby forming two very bad places for the food to be forced between the teeth: bad pockets are often formed, inviting

entrance of food to decompose and putrify; and subsequently there are formations of calcareous deposits. By this condition V-shaped surfaces are formed, both anterior and posterior, to the converging tooth, involving not only the posterior and anterior surfaces of the second molar, but also the posterior surface of the second bicuspid and the anterior surface of the third molar. In many instances I have noted all three teeth loosened with Pyorrhea, apparently solely as a result of this condition, with Pyorrhea pockets formed almost as far as, or wholly to, the apices of the roots. This may later lead to necrosis. I shall outline a treatment of this condition in its proper place. This leads us to the second classification, namely: Faulty Dental Operations.

#### FAULTY DENTAL OPERATIONS

It is a lamentable fact that many dentists are careless in some of the most important details of their work, with such results as: poor contact points, both in fillings and crowns; imperfectly finished cervical margins; crowns and fillings that strike the opposing surfaces too soon, causing evil effects from malocclusion, especially in anterior teeth where crowns and bridge abutments are too bulky, causing that anterior-posterior pressure, with ultimate loosening of the tooth; projecting or infringing crown bands, causing recession of the gums and, ultimately, pockets for the retention of debris and later Pyorrhea.

Other contributing causes of Pyorrhea are ill-fitting, partial dentures and imperfectly adjusted clasps on the same. A supply tooth attached to but one abutment is a crying evil, yet this is commonly practiced, especially in cases where a first bicuspid is missing, a crown being attached to a second bicuspid to support the first, or a central supporting a lateral. The supporting root is most assuredly doomed in time, for the leverage is too great. Irritation caused by careless use of ligatures and wedges in separating is also a prominent factor in Pyorrhea.

We have already discussed, under malocclusion, the sin of extracting six-year molars at an early age. I must also enforce the fact that dentists who are not familiarizing themselves with Prophylaxis treatment are inviting this disease. There are many other imperfections, all too commonly practiced, which time will not permit me to enumerate but which you have all seen.

If it has no other virtues, the study of Pyorrhea and Prophylaxis will increase the *standard* of a dentist's work in all branches of his profession. It is an aid to seeing and foreseeing the need of most careful procedure and the dangers attending unskilled operations, and a warning to him not to undertake to do work that he cannot perform properly. If he is not able or prepared to do this, he should seek another vocation. One great fault with a dentist, after he has gained an established practice, is to try to work for too many patients, which may create a temptation to slight somewhat the apparently minor but really important details. A dentist should

so regulate his practice as to be able to devote the proper amount of time to performing thoroughly and conscientiously all the operations he undertakes.

#### DEPOSITS

Let us discuss now the subject of "Deposits." These are:

- (1) Salivary calculus;
- (2) Serumal calculus;
- (3) Mucus plaques and that infectious mass of fermented and putrified food material so often formed in out-of-the-way places between and around the teeth.

The mucous plaque is that slimy, transparent, highly-infected gelatinous substance so often observed about the cervical margins of the teeth. It is a distinct irritant and is responsible for much damage.

Salivary calculus is that soft, mushy tartar found on the exposed surfaces of the teeth. It is infiltrated with bacteria, but usually causes little harm unless left there for a protracted period, when it hardens; or is precipitated in large quantities. If left to accumulate, it tends to create an inflammation which will precipitate its inflammatory products and by-products around and just below the cervical gum margin, thus creating Serumal calculus. This extends down the roots of the teeth, and as time goes on Pyorrhea pockets are formed. Then will commence to develop those flinty dark greenish deposits which are so difficult to remove. Serumal calculus is also firmly deposited in small granules upon the roots of the teeth and is nearly always found in deep pus pockets.

There is another deposit which forms just under the margin of the gums, which often almost surrounds the gingival margins of the teeth. This usually is well defined and does not extend very far under the free margin of the gum. It is generally easily removed and seems to be formed from the products of that mass of food debris which is located around the necks of teeth in patients not over careful in maintaining absolute cleanliness of their mouths. It, however, is a direct irritant and, if not removed, invariably invites serumal deposits.

Calcic deposits, especially serumal calculus, cause death of the periodontal membrane. Wherever these flinty deposits form the periodontal membrane is strangled and dies at that point. All deposits at or below the necks of the teeth cause temporary or permanent recession of the gums. If they are deposited upon the periodontal membrane the gums surely recede. Absorption of the process is due to irritation of inflammatory products and infectious material allowed to remain around the necks of the teeth, although there is often a slight recession due to advancing age.

Permit me to quote as follows from Dr. J. D. Patterson's chapter on "Pyorrhea Alveolaris" in Dr. C. N. Johnson's recent work on "Operative Dentistry":

"Any irritant, of whatever nature, which impairs the integrity and continuity of the gingival gum margin may cause pyorrhea, and without this



impairment the condition will not be established. This may be followed by another proposition, viz., systemic conditions or a constitutional diathesis, without local irritation, do not destroy the integrity of the gingival border.

"The irritation which may dissolve the integrity of the gingival border may be presented in various forms. The deposition of the calcareous salts from the saliva upon the necks of the teeth is the usual form of irritation. Next in importance may be classed the nests of putrefaction and fermentation about the gingival border and interproximal spaces; again, mouth-breathing dries the delicate border and thus function is interfered with, and in all these irritations we have the protective reaction of inflammation against the common enemy—irritation."

Dr. Patterson further states:

"The explanation of the source of the serunal or sanguinary points and plaques found in pyorrhea is the simple and reasonable one, that in all inflammatory conditions there are exudations, and whether they are simple serum, as in the first stages, or pus, as in the later suppurative stages, there is in this matter calcium phosphate, calcium-carbonate and magnesium-phosphate, and in the changed environment caused by functional disturbance, these salts are logically precipitated and thus form an irritant to the tissue about which it is deposited, inciting by its impact or touch inflammation of soft tissue and absorption of the bony tissue until the tooth organ is exfoliated. In the opinion of the writer, the serunal deposits in pyorrhea are subsequent to the initial inflammation and are directly from the inflammatory products."

#### DIAGNOSIS

Under the heading of "Diagnosis" I shall revert to a statement previously made, that Dr. M. H. Fletcher's classification of the various stages of Pyorrhea seems to be the most acceptable, namely: Primary, Chronic, Suppurative, and Necrotic.

We shall commence with a consideration of the primary stage. This is subsequent to the collection of deposits upon the necks of the teeth. They gradually extend under the gums and by irritation cause inflammation about the gingival gum margin. The gums are further forced away and more deposits form. They bleed easily and gingivitis is the result. If this condition continues without surgical interference, a chronic condition is established which is indicated by a red, irritated, inflamed condition which is sensitive and bleeds at the slightest touch. Serunal deposits are formed and then appear pockets and subsequently an exudation of pus which is, of course, the suppurative stage. This may continue further, and by continuous suppuration the alveolar process becomes affected and more or less absorbed. This will, in time, become infected with bacteria, and necrosis at this point is the result. A necrotic pyorrhea condition may also be brought about by irritation, inflammation, and infection caused by food being forced into meat pockets and by continuous presence of pus, as in cases of alveolar abscesses.

A Pyorrhetic condition does not necessarily mean loose teeth; there are many stages of Pyorrhea before that condition exists. Loose teeth are a result of pyorrhea which can be wholly prevented if the teeth receive

proper treatment in its earlier stages. Let it be understood that teeth may be absolutely firm and yet Pyorrhea can be present even in advanced stages.

#### TREATMENT

In considering the subject of treatment, there are two main steps to consider: First, the removal of absolutely all deposits; and second, the healing of the pus pockets and restoration of the gums to a healthy, firm, pink condition. This cannot be accomplished without first submitting these teeth to thorough instrumentation and subsequently polishing the roots and necks of the teeth. After that is done we may apply our stimulating and healing medicaments. Of course it is well, wherever the necessity is indicated, first to reduce any local sensitiveness and congestion of the tissues with medicines and an antiseptic, healing mouth wash before surgical interference. This will minimize the pain of instrumentation. It seems to me that the easiest way to describe treatment is to follow to completion the treatment of an imaginary case of advanced Pyorrhea.

A patient presents himself for treatment. He is shown into the chair. The dentist, with thoroughly cleansed hands, rendered sterile by sprinkling them with pure alcohol (to which is added a small quantity of Hudnut's or other good toilet water) and rubbed together until the alcohol has evaporated — commences examination. A typical case of true Pyorrhea is found, practically every tooth being affected, especially the anterior lowers and the molars in both jaws. The tissues are tender, turgid and inflamed; they present a reddish, purple color, and pus pockets, with pus exuding in many places, are in evidence. Several of the teeth are loose. Considerable dental work already has been done by others and we find, as is very frequently the condition in such a case, a good deal of very poor workmanship. Some crowns are ill-fitted, there are ledges at cervical margins of large approximal fillings, meat holes are seen between some of the molars, where food has been wedged and retained. This case will also have one of those converging second molars already mentioned as being due to early extraction of a six-year molar. Large cement fillings have been stuck in approximal cavities in bicuspid and molars and these are broken and worn down, leaving some pulps dead under them; they have thin walls and big V-shaped spaces between. As you look at such a case your heart sinks.

However, we commence first by thoroughly spraying the entire denture with a good antiseptic solution. Food is carefully removed from the meat holes and pus pockets, the mouth is again sprayed with a full strength three per cent solution of hydrogen peroxide; then with cotton rolls, cut into short lengths about equal to their diameter, the teeth are thoroughly wiped off and all loose debris removed. They are, after the mouth has been thoroughly rinsed out with water, touched up with an astringent and disinfectant such as pure zinc chloride, with just enough distilled water added to render it fluid; or the pyorrhea astringent recommended by Dr. J. P. Buckley of Chicago, composed of

Potassium Iodide, 60 grains;  
Iodine, 80 grains;

Zinc Phenolsulphonate, 60 grains;  
Water, 192 minims;

Glycerine, 100 grains;

The patient is then instructed as to the best mouth wash to use, also as to the necessary home treatment, and dismissed to return the next day, or the day after, when he will receive a similar treatment, though in addition, you will spend a few minutes removing some of the more bulky overlying tartar from about the teeth, and extract whatever teeth are necessary. These should include all teeth which have lost two-thirds or more of their attachments in the alveoli or those which can be moved freely in every direction. It is useless to try and save any tooth which has lost its bony attachment, for in nearly every instance the periodontal membrane has lost all its vitality and in all probability the entire root is covered with deposits of some kind; it may even have, at the apex, those prickly, spicula-like burrs or the apex may have been partially absorbed by pus, rendering it sharp and eroded. These are merely thorns in the flesh, and even in their least virulent state are pus generators which endanger the rest of the teeth and render impossible absolute oral asepsis.

I pass around several extracted teeth crudely mounted in plaster. These will illustrate the conditions mentioned, also showing the results of faulty dental operations, especially in crown and bridgework. Note the number of roots perforated and those unjustifiable single abutment bridges; note also the projecting ledges at the cervical borders of the crowns and the crude workmanship. These teeth were all lost through Pyorrhea.

To return to our imaginary patient, who should now be in condition to fulfil an appointment for the commencement of surgical work incident to freeing the roots of all deposits:

#### SURGICAL PROCEDURE

The treatment, prior to instrumentation, is the same as given during the first sitting, except, of course, application of the pyorrhea astringent.

It goes without saying that all dental instruments, especially those for treating Pyorrhea, must be sterile. These need not be a multitude, but should be well selected, and each one of distinct use. Among other instruments, a full set of Dr. D. D. Smith's files and scalers is most desirable.

One should endeavor to complete at the same sitting all teeth started, even if it be but one tooth, as a single thorough instrumentation ought to be all the surgical interference necessary. It may be advisable to resort to a tartar solvent in some stubborn cases to soften the deposits to be removed at a subsequent sitting, but as a rule this is not necessary. It is well to make it a rule to start always in the same part of each mouth, say at the last tooth on the lower left jaw, working forward and around to the last tooth on the right side. At the end of each treatment make a record of where you stopped, in that way making it easier at the next sitting to find out where you left off. Whenever we get to a rough filling, or a ledge projecting at the cervical margin, we should smooth it down flush with the tooth. When a filling is to be removed, do it at once and use that space, if desirable, for more convenient instrumentation between the teeth. Upon refilling the tooth, preferably with a gold inlay, be sure of the points of



contact, perfect cervical margins, and of maintaining the interproximal spaces. The same suggestion, of course, applies to crowns.

About one-quarter of the mouth can usually be finished at a sitting, except, of course, fillings and crowns, which, unless circumstances forbid, should be completed without delay. All fillings must be smoothed and polished. No matter who inserted them, they must be made as nearly perfect as circumstances will permit. Do no patching unless the fillings or crowns can be made as good as new by so doing. Do no cement work in permanent teeth, as permanent work. It is better to remove and renew all imperfect fillings and crowns than be uncertain as to results; one will often then discover some further trouble under these fillings, for if the outward appearances indicate careless work, the inside is certainly liable to suspicion. It is much better that the patient should receive a large bill for thorough work than a smaller bill for uncertain work. In cases where the gums are so receded in multirooted teeth as to expose their bifurcations, Dr. Smith recommends that, after as perfect instrumentation as possible, a good method is to prepare undercuts between the roots and fill the cavity underneath the crown of the tooth and between the roots with permanent gutta percha stopping. I have tried this in a number of cases and find it a successful treatment, keeping food and debris away from that impossible-to-keep-clean-place. It will, at least, help to promote a more hygienic condition in the mouth.

Time will not permit me to describe in detail the method of instrumentation. That, in any event, can best be learned by getting right to work and trying it. It is impossible to teach, by mere description, how to manipulate instruments. I will say, however, that to insure success every particle of deposit must be removed and one's fingers must be so educated that by the keen sense of touch, developed by experience only, one can feel, just as surely as if one could see, when the root is entirely freed from these irritants. If he cannot develop this keen sense of touch a dentist will never be successful in pyorrhea work.

When we get to that converging second molar, the best correction for the condition I know of is carefully to prepare the offending second molar for a gold crown; then, after thorough instrumentation and proper medication, to overcome the pyorrhetic condition, crown the tooth with gold, securing proper contact points and perfectly fitting the band at the neck of the tooth, providing proper interproximal spaces and normal occlusion. It is good practice to do this, when indicated, even before a pyorrhetic condition is established, as it will surely prevent much trouble at a later date. I pass around a plaster cast, illustrating a typical case of this condition, before treatment.

After instrumentation and polishing at each sitting, we must allow time for medication, which subject I shall take up separately.

Just at this moment I would like to read you a short extract from a paper written by Dr. D. D. Smith and read before the Northeastern Dental Society of Hartford, Conn., during the month of October, 1908. I read it as an illustration of the fruitlessness of systemic treatment for pyorrhea.

## A CASE IN PRACTICE

Here let me cite one of the worst cases of alveolar pyorrhea that I ever have treated. It was a case complicated with many loose pyorrhetic teeth and with an empyemic antrum, the cause of the latter being a pericemental abscess on the root of an upper molar tooth. When the patient presented himself with a greatly swollen face from the hands of a well-known dentist, he was suffering intensely, as he had suffered periodically for several years. The constitutional treatment of this case, between his doctor and his dentist, had extended over a period of about four years. I did not inquire whether or not he had "used Alkalithia freely," as the proprietor of this nostrum directs, but it was quite evident that whatever constitutional agencies had been used the exciting cause had not been removed, neither had the disease been cured. I was informed that the dentist in charge had kept the patient, a man of fine physique, about fifty-four years of age, in the belief that he had "gout in the teeth," and that before the pyorrhea could be cured he must be treated by his physician for rheumatism or gout—diseases, by the way, of which he had never had a symptom. This constitutional pyorrhea theorist, among other silly things, had insisted on complete abstinence from roast beef, and had told the patient repeatedly that "he would be better when the strawberry season was over," a prognostication probably from the same school of dentistry as those who recommend "the free employment of Alkalithia."—Inasmuch as the "strawberry" season is practically never over in Philadelphia, after two years of waiting the patient had about decided that he was doomed to perpetual suffering and the final loss of all his magnificent teeth.

There had been no intelligent effort made, either by the dentist or the physician, to remove the real cause of the trouble, hence the suffering.

It is now about four years since I instituted treatment for this patient. His mouth is today, and it has been for three years, in perfect health. The real cause of his four years of suffering was "eliminated" at the first two or three sittings. His pyorrhea was cured and his empyemic antrum completely restored in about four months. "The marked improvement and cure" did not result from "keeping the urine alkaline to tighten the teeth and remove the cause with Alkalithia," nor any other constitutional "ithias."

The cure was effected through ridding the mouth of the real cause, which was a removable infection on the teeth. This was done by surgical instrumentation, as described in my article on "Alveolar Pyorrhea; Its Cause, Sequelæ and Cure."

After removal of the real cause, a complete cure was effected by instituting treatment which kept the toxic irritants from re-forming on or about the teeth. In this manner the local inflammation and the necrosis were completely arrested, and normal nutrition speedily established—a result to be expected in every case.

I saw this patient for treatment in the beginning every day for about ten days; then every other day for a like period. From this time the periods of treatment were gradually lengthened until the improvement warranted only the regular monthly treatment, which has since been maintained. A marked change for the better was noted in less than a week, and the improvement steadily continued. No constitutional remedies whatever were given. He was required to abstain from all "uric acid eliminants" and all "gout" and "rheumatic" remedies, but he was allowed all the "roast beef," "strawberries" and other healthful foods that he desired. To show his appreciation of the present situation I transcribe a letter from him under date of September 1, 1906:

"Dr. D. D. Smith:

"MY DEAR DOCTOR: Pursuant to order to notify you on September 1st of my request for an appointment, I am now reporting for duty accordingly. I have successfully encountered all the dangers attending the late "strawberry season" and am now taking my chances with cantaloupes and peaches. Have thus far escaped ail injury through eating roast beef, with not even an indication of "constitutional vice" to trouble me. I therefore await your appointment with much pleasure and a grateful heart. Hoping you have had a restful vacation, and that you are in good health, I am

Sincerely and gratefully yours,

(Signed) W. P. B."

This case, with perhaps a hundred others that I have treated with like results, furnished the most substantial proof regarding the etiological factor, not in some cases, but in all cases of mouth pyorrhea.

This extract is so expressive, gentlemen, that it leaves practically nothing further to say on constitutional treatment without going into a lengthy discussion for which we have no time at present.

Dr. N. S. Hoff recommends re-plantation in certain cases. This may be successful where it is indicated and, I should think, is a phase of treatment well worth careful investigation. I have not yet tried this method, but intend to give it some consideration.

Splints are helpful when attached to a firm anchorage on each side, but they must have substantial support. It is a question whether or not it is more advisable to extract these very loose teeth at the onset and bridge in the space, using a carefully selected porcelain facing with abutments made in the form of splints constructed with gold aprons and posts on lingual surfaces. This method of abutments applies chiefly to anterior teeth. In posterior teeth regular or modified bridgework is most suitable.

We have to use abutments in any event, and a properly-constructed bridge appeals to me as being a much more cleanly appliance and most assuredly more permanent. Teeth should never be wired together, as the wires are only irritants and filth retainers.

#### MEDICATION

Medication is a phase of treatment not to be ignored but about which little need be said. Proper medicines must be applied at every sitting until



the case is completed, but care must be taken not to overdo it. After instrumentation and polishing, all debris should be washed and sprayed from the pockets, from under the gums, and from around the teeth, with an antiseptic solution. Phenol Sodique is then applied with cotton or as a spray and the pockets are touched with deliquesced zinc-chloride, on wood point only, or some other good pyorrhea astringent.

Bifluoride of Ammonium is occasionally indicated where pockets are deep and all deposits very difficult to reach, but it is a dangerous drug to use and is seldom really necessary.

Phenol-Sulphonic acid is indicated in bone complications and where it is difficult to control suppuration. In such cases, however, there is usually dead bone at the bottom of the pocket which, where recognized, should be carefully burred or curetted away and the pocket thoroughly washed out with a hot antiseptic solution, then touched with phenol-sulphonic acid. At future sittings, after the pocket is thoroughly flushed out, Dr. Beck's formula might be injected from time to time until healed.

#### INSTRUCTION TO THE PATIENT

The patient is, at the onset, instructed as to proper home treatment, the general care of his teeth, the proper massaging of the gums, and a good tooth paste or powder prescribed, the powder to be used at night and the paste in the morning, while after each meal a thorough cleansing and brushing of the teeth with a reliable astringent mouth wash is advised.

A properly shaped tooth brush is also recommended, one which will clean the lingual surfaces of the teeth as well as the buccal and labial, at the same time reaching the distal surfaces of the third molars. The "Preventum" tooth brush and Dr. D. D. Smith's are both good, the "Preventum" being especially indicated where the arches are small and irregular.

"Zhongiva" is the best all around mouth wash that I know of and is especially indicated in pyorrhetic mouths. The formula is secret, but the results are uniformly good. It is applied pure on cotton, or with the tooth brush, at least twice a day. Diluted two or three times with water, it is used several times a day as a general rinse for the mouth. It is soothing, healing and stimulating.

The patient must do his part faithfully to maintain vigorous oral asepsis.

#### NECESSITY OF ORAL PROPHYLAXIS

A paper on pyorrhea can never be complete without a few words on oral prophylaxis, and I shall only comment upon this, at this time, as a treatment to prevent a recurrence of trouble after a cure is effected. We can practice oral prophylaxis without there being pyorrhea, but we cannot cure pyorrhea and keep it cured without the oral prophylaxis treatments at frequent and regular intervals. These treatments should not be longer than a month apart.

Oral Prophylaxis treatment is a subject for a paper in itself, so I shall make but a few remarks before passing on to a conclusion.

After your case is considered under control and ready to be dismissed we must remember that it will often take several months of rigid oral asepsis for the gums to regain their maximum hardness. This oral cleanliness must be maintained by both the patient and the dentist. A prophylaxis treatment must be given regularly and thoroughly once each month, or, if indicated, every two weeks. The patient must be impressed with the necessity of this, for it is of the utmost importance. Silk floss must be used by the patient between the teeth every night, he being careful not to irritate the interproximal gum tissue. Much salivary calculus can be prevented from forming about the backs of the lower anterior teeth by the patient's passing a length of silk floss on both sides of each tooth, forming a loop at the lingual surface of the tooth. Working the floss to and fro will clean this part very satisfactorily, though of course this does not take the place of a tooth brush.

At each treatment the dentist must criticise the patient's own care of his teeth and show where he can be more thorough, if necessary. A touch of zinc-chloride here and there at the end of the treatment is often required.

#### GENERAL CONSIDERATIONS

In undertaking a case of pyorrhea one must be rather conservative of one's promises and expectations. Do not expect that every loose tooth is going to tighten up, even with the most thorough care and conscientious treatment. In commencing, a man will be discouraged and disappointed many times before becoming competent along this line, and no man should undertake the work who is not prepared to realize this fact and persevere until he becomes expert.

Pyorrhea is a subject yet to be more fully investigated. There is much room for more scientific research work. We cannot at present get perfect results in every case or even as good, I think, as we ought. However, during the past three or four years rapid strides have been made in the diagnosis and treatment of this disease, consequently humanity has been greatly benefited.

Before starting this paper, I felt it would be difficult to get enough material to make it worth while, but when I commenced to work it up I found so many things I wished to comment upon; so many cases in my own practice I would like to describe and had to leave out; and there are now so many things I feel I ought to have mentioned and have not, that I fear my little effort has been incomplete, but I cannot overlook the fact that the paper is already longer than it ought to be, and I must not inflict my own enthusiasm too deeply upon others.

In conclusion, I wish again to acknowledge my indebtedness for quotations from such authorities as Dr. D. D. Smith of Philadelphia, Dr. N. S. Hoff of Ann Arbor, Dr. J. P. Buckley of Chicago, Dr. E. S. Talbot of Chicago, Dr. M. H. Fletcher, and others.

**MECHANICAL RETENTION OF PARTIAL DENTURES\***

By Dr. H. B. Ford, Bluffton, Ohio

In the first place I want to state this device is not my own, but simply a "Gilmore Clasp." But, through this clinic, you may more fully grasp the usefulness of this little device. If the attachment is to be made to a shell crown, Richmond crown, or gold inlay, proceed as for ordinary bridge-work. Make the model of investment material so that the angle bar can be soldered to the crown or to an inlay. After the angle bar has been adjusted to the model and crown it may be temporarily fixed to the latter with Parr's or other flux wax. To hold it in position while soldering it to the crown, it is best to fasten the horizontal arm to the model with a small amount of investment material. The crowns, with angle bars attached, may now be placed in position in the mouth and second impression taken and the crowns transferred to a plaster model. Before "waxing up," a small amount of plaster should be spread along the sides of the horizontal angle bar to obliterate the under cut and prevent the vulcanite from engaging the round bar, rendering its removal difficult after vulcanization. The attachment may now be placed on the bar with its anchor arms facing lingually or buccally, lingually if the bite is short, thus giving room for the artificial teeth. Wax, invest, and pack in usual manner.

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\*Clinic at Ohio State Dental Society.

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**DIAGNOSIS OF DISEASES OF THE PULP BY THE  
ELECTRIC CURRENT\***

By Ira M. Saum, D.D.S., Cleveland, O.,

The action of the electric current on a sound or normal tooth expresses itself in a definite sensation, such as a tingling if the correct strength of cement is used, and which is determined by the resistance of electric stimulation of each individual case. The inflamed or irritated pulp responds more readily to the electric current than does the normal pulp, the irritation from the current increases in direct proportion to the amount of inflammation present.

The inflamed pulp, with pus micro-organisms present, responds to the electric current less readily than does the normal pulp. The dead pulp does not respond at all to electric stimulation.

The electric current is a valuable aid in establishing a definite diagnosis in many otherwise difficult cases.

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\*Clinic at Northern Ohio Dental Society.



## THE RELATION OF THE ORAL HYGIENE MOVEMENT TO THE MUNICIPALITY

*Continued from Page 547 July Summary*

### **The Relation of the School to the Dental Movement.\***

**By J. S. Hauer, Principal of Sixth District School, Cincinnati, Ohio.**

We have heard so many splendid things said this evening, so many words of commendation and approval of the Dental Movement in the Public Schools, that it really seems unnecessary for me to add my bit of evidence and experience in its support.

The Cincinnati Dental Society has been ardently fostering the dental movement in our city for more than two years. Its busy members have done a prodigious amount of work and given much of their valuable time; yes, many of us know, unfortunately, that they have quite an exalted opinion as to the value of this time, but they gave it cheerfully nevertheless. Many of them labored incessantly, I may say, day and night, by giving talks and illustrated lectures to the children and adults in every part of the city in order to educate them and impress upon them the vital necessity of the work.

Three years ago, after the first dental examination of the pupils in our school, we were amazed, and so was everybody, at the results. About 90 per cent of the pupils had defective or decayed teeth, and we also found out how little use was made of the toothbrush. Every pupil, after the examination, was given a statement or individual report of the results of this examination; and when these were taken home some of the parents set to work immediately to have the defects remedied. The big majority, however, did nothing for the simple reason that they could not afford it, and a few, through ignorance or indifference, scoffed at the idea. One father told his boy that his teeth had been decayed twenty-five years, that the work was not necessary; and sent word to me "that he did not believe in dentists no how." The boy's teeth were cared for. He had it done at a dental college. During the school year of 1910-11, the free dental clinic was opened by this society and then we had smooth sailing. The demand for work at the clinic has always been greater than the accommodation could take care of. Besides the many children from the different rooms in our school who had dental work done, we had all the pupils in two sixth-year rooms and one-half of a fifth-year room, about one hundred and twenty-five in all have had their defective teeth treated and filled or extracted either by their own dentist or at the clinic. If this matter is carefully and tactfully handled, you meet with very little opposition from the homes in our downtown schools. Just as soon as the children understand and realize the importance and need for this work, you have half the battle

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\*Address before the Cincinnati Dental Society, 1912.

won. They will take up the problem in the home and do most of the fighting. Our experience has been that in only two or three cases out of a hundred is it necessary for one of us or the nurse to visit the home and confer with the parent, and in no case have we yet utterly failed.

At the beginning of this school year Dr. Rauh suggested that we try to find out what effect it will have upon the pupils of a certain class or room in our school if they be given special dental attention and instruction in dental hygiene, including the proper mastication of food. I recall that he said, "I am ready to have this whole movement stand or fall by the results." In Cleveland, you remember, an experiment was made in a school, the Marion, I believe, where a class of forty pupils was collected from the whole school. This class was made up of backward or retarded and troublesome pupils. They were given special attention and, judging from the reports emanating from those connected with the school, the results were really gratifying. The wholesome effect the work had upon the mental and moral activities of the children was wonderful. These were ascertained by comparing the school reports of the children after the experiment had been in progress ten months, I think, with the reports they had previous to making the experiment.

1st. These pupils, being collected from the whole school, most of them would of necessity have had a different teacher in the experimental class, and it is well known to us who have dealings with a number of teachers that their judgments differ very materially in the interpretation of marks and their value. 2nd. Did they have an exceptionally strong teacher? And 3rd. Was undue influence brought to bear, i. e., were the pupils informed as to what was being done and why? A wide-awake, tactful teacher, with a strong personality, can accomplish wonders with 90 per cent of her class, I dare say. Yes, she could, with their reputations at stake, make so strong an appeal that if there were a spark of mental or moral fiber left within them, she could fan it to a blaze.

In trying the experiment in our school we tried to have conditions where the foregoing questions could not arise. We have two rooms in the fifth year in which the pupils study English and German. They come from about the same style of homes and they both have good, earnest teachers. To one we assigned the Experimental class and to the other the Control class. In fact, after the assignment had been made some one said they had hoped the other teacher would get the Experimental class. I replied, there is practically no difference. The selection was made in my office, by me all alone, with the flipping of a coin. The organization of the classes had been made before the experiment was suggested, and the scholarship of the pupils was about the same. There were six or seven left-overs in each room and an equal number with the mark of good and medium in each room. Early in the year the Experimental class was given a special dental attention. The teeth of all were cleaned, all cavities filled and the necessary extractions made by their own dentists or at the clinic. Instruction in

dental hygiene was given and from time to time inspections were made by the dentists as an incentive to the pupils and to show also to the local and visiting dentists what was being done. The Control class was given the usual instruction, nothing more or nothing less. Psychological and other tests were made on all the pupils in both classes by experts from the Child Labor Bureau of this city. These results were carefully tabulated, and I understand that of them a report is about to be published. A second test for comparison will be made in the near future.

What these results will show we do not know. But there are some things we do know, tangible effects and, briefly stated, are as follows:

First—Attendance: The average monthly absence of the Experimental class is a little less than that of the Control. There could not possibly be much difference, because we watch the attendance of all the children very closely. We have either a truant officer or probation officer at school four days out of five and all the absence is sent to the office every day. So you can readily see there is “not much chance.”

Second—Scholarship: In the latter part of January an examination was held and both classes were given the same questions. The teachers were conferred with as to how each question should be marked, and where there were several parts to a question as to the value of each part, so that all the pupils would be marked alike. I afterward looked over the papers to see how the pupils did, and found that they were marked in accordance with instructions. The class average, in arithmetic, geography and spelling, these subjects that would test their scholarship, was 16.5 per cent higher with Experimental class than in the Control. In other words, the class average in these subjects was 85.4 per cent in one class and 68.9 per cent in the other. A very pronounced difference, you will observe. The lower average of the two is, I thought, about normal, because the questions were not easy. The difference may not be wholly due to the dental attention given the children, for one thing entered into the experiment that we at school could not control, and we tried to, that was the Experimental class found out at the end of two months that it was such. I mention this fact in order to treat this topic fairly and impartially.\*

Third—Physical Improvement: The general appearance of the pupils, for a downtown school, has been above par. In some instances the improvement in this direction cannot be appreciated unless you knew the pupils then and now. It is, indeed, a pleasure to note the pride they have in their personal appearance, and the splendid manner, spirit and general attitude they manifest in their class work.

#### SUMMARY

The earnest and unselfish efforts of this society in behalf of the dental movement in our city is worthy of our unstinted praise. That its work has been constructive makes it most commendable.

That the work has proven to be mentally, morally and physically beneficial to the pupils.



That four-fifths of the people living in our school district cannot afford to pay for dental work. Forty-seven pupils out of a class of fifty live in rented homes, and most of them in tenements.

Our sympathy has largely been with the work for the simple reason that anything which lends itself toward the improvement of the health of our future citizenship is meritorious and deserving of support.

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### Attitude of Medical Profession to Dental Movement.\*

By Wm. D. Porter, M. D., President Cincinnati Academy of Medicine,  
Cincinnati, Ohio.

The relations existing between the professions of medicine and of dentistry have always been of the most cordial character. Indeed, strictly speaking, dentistry is a department of medicine, although it is so highly specialized as to require an exclusive educational training.

No physician who has been in practice for twenty-five years can have failed to notice that dentistry has made rapid advances. Formerly many cases of infection resulting from decayed teeth or diseased gums drifted or were referred to the surgeon. Now, as a rule, such cases are better handled by the dentist because they are recognized before they become serious or dangerous complications. This advance is mentioned because it is the one which physicians are most likely to note.

Fortunately the work of the dentist is largely along the lines of prevention—of prophylaxis. His patients are carefully and patiently instructed in the proper daily care of the teeth. His *ideal* patients report at regular intervals that the teeth may be carefully inspected. In this way destructive tendencies are recognized and corrected before much harm has been done.

In addition to this valuable routine work, the dentists are doing some very wonderful things. If Nature blunders and constructs the dental arches too narrow or sets the teeth in their foundations at unseemly angles, the modern dentist is able to correct such deformities provided he gets to work while the tissues are still plastic—that is, before they quit growing. And these results are attained with a precision that is amazing even to one who, in a general way, is familiar with the underlying anatomical, physiological and mechanical principles.

To say nothing of relief from atrocious suffering, and the prevention of unsightly and even malignant local conditions, it is impossible to estimate the beneficial effects of good dentistry on the general health. The resistance of the individual is largely measured by the state of his nutrition. It is not putting it too strongly to say that good teeth are essential to good health and that they constitute an important factor in the protection of the individual against many diseases. It is, therefore, a serious matter that any child should grow up untrained in the proper care of the

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\*Read before the Cincinnati Dental Society, 1912.

teeth or untreated for ailments which are trivial in the beginning and readily corrected, but which, if neglected, may destroy many of his teeth.

This neglect is mainly from two causes. A small proportion of our population is unable to provide for more than the primary needs of food, clothing and shelter. In a much larger class the neglect is due to ignorance of the necessity for frequent dental inspection, and to the fact that the importance of the prompt treatment of abnormal conditions is not realized. These two classes are effectively reached by public school inspection.

Enough work of this kind has been done to show conclusively that it is needed. In the last number of the *Ohio State Medical Journal* there is an article on Medical Inspection in Public Schools by Dr. B. P. Brockway of Toledo. He gives a table showing the percentages of abnormalities in an aggregate of 2400 pupils. Twenty-five per cent were found to have defective vision; 18 per cent had nasal troubles; 28 per cent had diseased tonsils; 19 per cent had glandular troubles; 40 per cent, or nearly a thousand of the 2400, had defective teeth. In one school of several hundred 70 per cent had defective teeth. In most of the cases the cooperation of the parents was readily secured, and dentists reported more work on children's teeth the year of this report than in any three previous years. The following sentence is from Dr. Brockway's article: "Pupils having an unhealthy condition in throat, nose or teeth who could not afford care have been treated at hospitals or dispensaries, and I wish to pay tribute to the work done by saying that it has been as good as the best."

At the beginning of this movement for medical inspection there was much skepticism both as to the need for the work and as to the propriety of doing it. To the stickler for professional ethics it seemed a questionable procedure to go out into the masses to select and tag those needing treatment. The leaders in the work were sometimes thought to be seeking means of self-exploitation. The protest was raised that in many cases medical charity was abused and that it tended to pauperize those who received it.

Gradually these objections have been overcome. It has been shown that great need exists for this work and that great benefits are being secured. The direct beneficiaries are children, and such charity cannot hurt children because they are getting only that to which they are entitled, being naturally dependent. And such benefits at once become potential factors in their future usefulness. In many cases it amounts to an assurance against pauperism in mature years.

We are just beginning this great work looking to the welfare of children. The watchword of equal privileges for all will have in the future a far more liberal interpretation than has ever been dreamed of.

The effort will be to so correct and minimize the physical disabilities of children that they may grow to manhood and womanhood strong enough to utilize the great privileges of a free country.

This work is needed now more than it has ever been needed before.

The great reduction in infant mortality has put an artificial check on the law of the survival of the fittest. Formerly the weaklings were largely eliminated in the first few years of life. Now, by rational methods of feeding, by better hygienic conditions, by the use of antitoxins and in various other ways many of these weaklings are saved.

This results in an increased number of defectives among children. There is a larger proportion who are below par than there would be if the natural law of the survival of the fittest were unhampered.

Of course it is a great triumph to save these children from perishing in infancy, but the work is woefully incomplete unless these are watched and cared for and made to develop up to the full measure of their possibilities. Many of these children have bad hereditary tendencies, and many of them have unfavorable environment. It would be well if they could be looked after in a systematic manner before they reach school age. Eventually this will be done. At present school inspection seems the best way of beginning this work.

At present there are no philanthropic movements that offer greater opportunities than this plan of looking after the physically deficient children who otherwise would be neglected. It is infinitely better to give these children a fair chance to grow up into useful, independent citizens than to organize charities for them after they have reached a state of partial or entire dependency, as a result of ailments that could have been corrected in childhood.

We hear much of the awful danger of race suicide, but instead of weeping over hypothetical children we will do much better to devote ourselves to the welfare of the actual flesh and blood children with which we are surrounded.

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### **The Relation of City Health to the Dental Movement.\***

**By Dr. J. H. Landis, Health Officer, Cincinnati, Ohio.**

To the average layman the title of this brief paper conveys no idea of the importance of the subject.

It requires very little evidence to convince the consumer of food of the necessity of having it handled in a clean and sanitary manner. Anyone visiting dairies, representing the two extremes of sanitary precaution in the production of milk, would have no difficulty in choosing the right one from which to secure his dairy products. No one thoroughly alive to the necessity of observing scrupulous care in protecting milk from contamination in its various stages of milking, cooling, bottling, and shipping would consent to rendering all these precautions negative by improper care after its arrival in the household.

Inspectors are provided for slaughter houses, markets, restaurants, hotels, ice cream parlors, confectionery establishments, bakeries and numerous other places where food is prepared and sold. The public is rapidly becoming educated to the importance of all these places being clean and

\*Read before the Cincinnati Dental Society, 1912.



sanitary, and the proprietors of these various industries have come to regard improved conditions their most valuable asset in business and the best advertisement they can secure in extending trade.

To the consumer it makes no special difference in the final results if food is to be contaminated, whether this contamination takes place at the point of production or at the point of consumption. Any food may be delivered to the consumer absolutely fit and be rendered unfit by improper storage, cooking or care in the home.

It may pass all of these possible sources of pollution and meet its Waterloo in the mouth of the user, for the mouth is but one of the substations food has to pass through before being presented to the body for the purpose of increasing growth, repairing waste, or producing heat or energy. A great many physicians, in treating cases of indigestion, anaemia or malnutrition, direct their first inquiry to the condition of the patient's mouth. They realize that many conditions in this cavity are potent factors in the production of abnormal conditions in other parts of the body.

It is here that the first stage of indigestion begins and where food is prepared by mastication for the action of the digestive juices. Of the numerous conditions in the mouth which cause indigestion, anaemia or malnutrition, the most important are carious teeth, chronic abscesses, pyorrhea alveolaris, inflamed gums and deposits of tartar.

Normally, the mouth presents ideal conditions for the growth of bacteria. The above pathological conditions cause breaks in the teeth or gums and open the way for a possible systemic invasion. It is claimed that upward of twenty varieties of organisms, many of them pathogenic in character, are normal residents of the mouth. Streptococci and staphylococci are always present. The pneumococcus, tubercle bacillus, and diphtheria bacillus are frequently found.

In an infected wound of the hand treated at the City Hospital, due to a bite of a human being, Dr. W. H. Peters isolated in pure culture, Vincent's fusiform bacillus.

During last year the Cincinnati health department took discharge cultures from carious teeth in sixty-seven cases of diphtheria. In one instance the diphtheria bacillus was isolated. While one case out of sixty-seven is a very low percentage, it does show that carious teeth might be the cause of infection in this disease.

The constant discharge of pus from these various conditions and its intimate mixture with the food produces in many people a low grade of sepsis. No one can be at his best physically with his stomach loaded, three or more times a day, with food rich in pus-forming organisms.

It is believed that many cases of gastric catarrh are due to their presence, and there is reason to believe that they may be one of the causes of appendicitis.

"One investigator, who has given years to the study of mouth bacteria, has estimated the number of germs in one unclean mouth at 1,140,000,000." The presence of the bacteria, with their poisonous products, is only one of the evil results of the diseased and unclean mouth.

Pain and tenderness make thorough mastication impossible, and food is swallowed in a condition adding greatly to the length of time necessary for digestion. Indigestion and the presence of bacteria and their products lower the vitality and resisting power of the individual, and he becomes more susceptible to all varieties of infection. Normal development becomes impossible. Dr. Osler says: "There is not one single thing more important to the public in the whole range of hygiene than the hygiene of the mouth. If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should unhesitatingly say defective teeth."

In his introduction to his book, "Oral Sepsis as a Cause of Disease," Dr. William Hunter has this to say relative to the influence of an unclean mouth upon the health of the body as a whole: "I desire here to point out how common a cause of disease it is, how grave are its effects, how constantly it is overlooked, and what remarkably beneficial results can be got from its removal. What I wish to emphasize is that it is not the stomatitis, or the dental caries, or the absence of teeth, or any disturbance of nutrition in connection with defective teeth that cause all these effects. The condition in one and all is that of profound sepsis; that is to say, we are dealing with pus-forming organisms which are constantly present in the mouth in connection with necrosed teeth."\*

Just what defective teeth and unclean mouths mean to a community financially may be gathered from the fact, established by investigators, that it requires children at least six months longer to complete the eight common school grades than it does those without defective teeth.\*

The claim is made, and it is shown to be true, that from 90 to 95 per cent of school children have some dental defect. The class under observation and treatment in one of our public schools for the past seven months shows a higher percentage of attendance than the control class.

When the physical and mental tests have been made, it is the firm belief of those interested in the dental examination of school children that the relation of city health to the dental movement will have been positively demonstrated. It requires a great deal of time to demonstrate to a majority of the public the value of any new departure in improved sanitary conditions. The public has to be educated, and almost invariably the initial cost is borne by private individuals. Your organization deserves a great deal of credit for its expenditure of time, money and effort in demonstrating the value of dental inspection and treatment of school children.

If the recommendations of the health office are followed, future expense in continuing and extending the work will be paid by the city. The expense incurred would be a real economy. It means more perfect physical development, greater freedom from preventable disease, a shorter average period in school, and a wider dissemination of information concerning hygiene.

*(To be Continued)*

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\*Merritt (The Public Health Movement, March, 1911).

# SOCIETY ANNOUNCEMENTS

## NATIONAL DENTAL ASSOCIATION

The 1912 session of the National Dental Association will be held in Washington, D. C., September 10th to 13th, and all indications are favorable for this being the most important and successful meeting that this association has ever held.

The Local Committee of Arrangements has selected the New Willard as "Headquarters Hotel" and necessary accommodations for the meetings of the general sessions and sections, as well as the "all-day clinic" on the last day, are to be held in the commodious ballroom on the eleventh floor of this hotel. This provides the ideal arrangements for a successful meeting, that is, all under one roof.

The reorganization proposition has been receiving most liberal support from the State Societies, which have met since the Cleveland meeting, when a constitution along the lines of the American Medical Association was tentatively adopted. This question will come up at this meeting for final action, and every one interested in the perfecting of a representative National Dental Association should be present. You are respectfully requested to remember this meeting when making your vacation arrangements, as this presents an excellent opportunity to attend the meeting of the National Dental Association and visit our National capitol.

The following are on the literary program for addresses, lectures and essays: Dr. Arthur R. Melendy (President's address); Drs. Newell S. Jenkins (Dresden, Germany), Harvey W. Wylie (M.D.), Leon S. Medalia (M.D.), F. E. Stewart (M.D.), C. V. Conzett, B. Holly Smith, M. L. Rhein, T. B. Hartzell, George E. Hunt, C. A. Hawley, George B. Harris, W. O. Hulick, M. C. Smith, C. M. McCauley, W. A. Lovett, Joseph Head, H. H. Johnson, J. F. Biddle and J. J. Moffitt. Have not been furnished with all the subjects of the above at this date, July 10th, and for that reason all have been omitted; however, all of those selected are men of recognized ability and they will cover the important subjects before our profession today.

The report from the chairman of the Clinic Committee is most encouraging for an interesting clinic. This will be classified, so that a person interested in some particular subject may study this through its progressive steps.

Information regarding railroad rates may be secured from your local agent, as conditions vary in different sections of the country. Any agent will gladly furnish any information requested.

HOMER C. BROWN, *Recording Secretary*,  
185 East State St., Columbus, Ohio.



# THE DENTAL SUMMARY

The Magazine That Helps

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## SULPHURIC ACID AS A DEVITALIZING AGENT\*

By L. E. Custer, A.M., D.D.S., Dayton, Ohio.

WHEN DR. J. R. CALLAHAN, in 1893, gave to the dental profession his method of opening up pulp canals by the use of sulphuric acid, he not only revolutionized this difficult work, but he prepared the way for further advance in the treatment of the pulp canal and its contents. I refer now to the use of sulphuric acid as a devitalizing agent for the dental pulp. Dr. Callahan advocated the use of a 50 per cent solution for the disclosure and enlargement of the finer root canals with which we have to deal—canals which are too small and too tortuous to be safely enlarged with a drill. No step in the treatment of pulpless teeth has equaled this in importance. Not only does this solution enlarge existing pulp canals, but it discloses pulp canals that are so completely obliterated

\*Given as a clinic at Ohio State Dental Society.

that the ordinary methods of dehydration fail to reveal. Dr. Callahan advocated the acid because of its efficiency and safety when used with discretion. He also called attention to two other properties, namely, bleaching of the pulp canal and sterilization. When used as advocated by Dr. Callahan he pre-supposes a dead pulp.

After eighteen years' use of this agent, I have observed that when used in stronger solutions that it is an efficient and safe devitalizing agent for the dental pulp. Dr. W. H. Sillito of Xenia has been using it extensively for the same purpose. When used upon the live pulp for the purpose of devitalization it is not subject to speculation as are most other agents used for this purpose. Its action is positive and definite and it is self-limiting.

Arsenic has held the position of a pulp poison for three-quarters of a century and is still to be used for the first application upon fresh exposures. I have never been able to harmonize my college training in regard to the action of arsenic, as I have found it in practice. We were cautioned never to leave arsenic in a tooth over twenty-four hours, and no doubt all of you have seen cases in which arsenic has been sealed in a pulp twenty-four days with but little effect upon the pulp. For children, the twenty-four-hour limit is about right, but for adults, and especially where pulp nodules are present, a much longer time is necessary. The physical condition of the patient, and more especially the condition of the pulp at the time of making the application, are factors which determine how rapidly the arsenic will have its effect. My observation has been that there is no procedure in dental practice—no response to medical treatment—that is so erratic as pulp devitalization under arsenic. In one case the pulp will die quietly and promptly without a kick, and in another case there will be the most violent toothache, and no mule has ever been so stubborn as a dental pulp which has made up its mind not to take in this poison. Repeated applications only irritate. Here especially is where sulphuric acid is indicated.

In 1900 Dr. A. W. Harlan proposed the use of papain as a pulp digester, but, as clearly mentioned by him, this also pre-supposes a dead pulp at the beginning.

The sulphuric acid treatment which I have to recommend presupposes a live pulp, one which after an application of arsenic has not died in its entirety and further applications seem to have no effect. You are all aware of the difficulty of devitalizing the last third of the dental pulp if it does not respond readily to the first applications. It is here that the sulphuric acid gives the nicest results. After whatever of the pulp that has been devitalized by arsenic has been removed and life is found an application of strong sulphuric acid is worked into and loosely sealed in the pulp canals. The outer dressing must not be air-tight in order that the gas arising from the acid's action may find escape. In many cases, if the arsenic has only killed the bulbous portion of the pulp the acid may be worked slowly to the apex of the root with a smooth platino-iridium broach

with but little pain, and here is the special advantage in the use of the acid. Sulphuric acid has a marked affinity for water; it unites with the oxygen and hydrogen of the pulp, leaving a devitalized and disorganized remnant, which is much more easily removed than where a typical coagulating agent, such as carbolic acid, is used. The  $\text{H}_2\text{SO}_4$  at the same time acts upon the pulpal wall, enlarging it, leaving a white coat of calcium sulphate. We thus have three things accomplished in one act—the pulp is killed, the canals are enlarged and the walls are bleached, and I may add another, the canals are thoroughly sterilized and are ready for filling.

In order that the acid will act upon live pulp, it must be used almost pure. Bear in mind that for Dr. Callahan's purpose, the enlargement of the pulp canals, it presupposes a dead pulp, and he advocates a 50 per cent solution, whereas for action upon the live pulp tissue we have quite another condition to meet. Live and healthy tissue has the property of resisting, in a marvelous way, the action of irritants and corrosive agents. The nitric and hydrochloric acids in various proportions will destroy live tissue which is in an abnormal condition, but will stop short when live, healthy and normal tissue is reached. An exposed pulp is not in a normal condition, and after it has had a touch of arsenic or has been exposed for some time it does not possess the resistance that is characteristic of live and healthy tissue. It is for this reason that strong sulphuric acid will overcome the resistance of live tissue, as found in the dental pulp, and will quickly disorganize it.

There is a marked difference between arsenic and sulphuric acid as to their relation to live pulp tissue. Arsenic will only irritate an inflamed pulp and will not be absorbed until the inflammation has subsided, whereas strong sulphuric acid positively and surely devitalizes immediately as deeply as it penetrates. It continues its travel toward the apex of the root as long as the successive layers affected are removed. It does not destroy the vitality of the pulp as a whole, but by gradual penetration, and herein lies the safety of this agent. While the sulphuric acid may be worked through the apex of the root by pure carelessness, yet the condition resulting from this is quite unlike where arsenic has penetrated the apex. No one knows how far the effects of arsenic reach, whereas with sulphuric acid it is limited and entirely within the control of the operator. If by idiosyncrasy the arsenic effect penetrates the apex of the root an injury is done which Nature is a long time repairing and, in many cases, never effects a complete repair, whereas if sulphuric acid should find its way through the apex a permanently bad condition never results.

Every one is aware of the difficulty of devitalizing where pulp nodules exist. It is here especially that the use of sulphuric acid is indicated. If an application of this acid is made less pain is experienced, and this is always of shorter duration than where arsenic is used. At the next appointment the pulp nodule will be clearly seen, and in the majority of cases



it will be found to be quite loose. The acid has not only broken up the surrounding pulp tissues, but the nodule has been slightly dissolved, which makes it readily removable.

In making the application an S. S. White or minim dropper is used, taking up but half a drop of the acid at a time. I need hardly tell you that care should be exercised in order that not too much acid is used at a time. When the floor and no more has been flooded, a smooth platino-iridium, or preferably a tungsten broach, is employed to gently puncture its way into the canal. It is a good plan to have a glass of saturated soda solution always at hand in the cabinet in case of overflowing the cavity with the acid. It will be noticed that just as far as the broach penetrates that the pulp is disorganized and easily taken out. This is quite different from the action of carbolic acid when used to remove the apical third. The carbolic acid coagulum is slow in losing its sensation and is difficult to remove.

The strength of acid used for this purpose should be above 75 per cent, which will act upon cotton. When, therefore, a dressing of this strength of acid is to be left in for any length of time, I have found that asbestos wool, not being acted upon to any extent by the acid, will serve instead of cotton.

As soon as tungsten can be had in suitable size for broaches we will have a metal almost as stiff as steel and one which is not acted upon by sulphuric acid.

In summing up, sulphuric acid 75 to 90 per cent pure is indicated as a devitalizing agent where arsenic fails and is especially useful where pulp nodules are present.

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## A NEW AND HANDY ELECTRIC WATER HEATER AND STERILIZER\*

By A. F. Linscott, D.D.S., Marion, Ohio.

**P**ERHAPS there is nothing more important in dentistry than cleanliness. We render our hands and nails aseptic, but far more important to me are the instruments we are daily using in our patients' mouths.

It has been agreed by eminent men in the medical and dental profession that heat, properly applied, is one of our best agents for sterilization, yet there are organisms which a few minutes' heat will not destroy.

We have here a novel arrangement for water heating and instrument sterilization, which consists of:

1. A wire from electric socket;
2. A plug and lamp;
3. An outlet on side of plug for heater;
4. Two glasses with covers;

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\*Clinic at Ohio State Dental Society.

5. Two holders for glasses;
6. One dipper for small instruments;
7. Cord and heater;
8. Distilled water.

If things are close at hand and we do not have to go about the office looking for a pan or kettle to clean our instruments, then we never forget and perchance use something in our patients' mouths that might contaminate and in the end prove fatal.

I have here an electric heater both for sterilizing instruments at the chair and heating water for the syringe in the shortest possible time and at the lowest possible cost to operator. First of all, I have fitted into an ordinary electric socket a plug and lamp with outlet on side for attachment of heater. The purpose of the lamp is to determine whether heater is on or off. On the one hand, I have a water glass filled with distilled water for the syringe. When I pick up mirror to examine a patient's mouth I turn on the current and in fifteen or twenty seconds later have warm water for the syringe, should I need it. If I do not need it then I have consumed no extra time in getting it. To get a pan, go to the water faucet, secure a match, light the gas and wait five minutes for water to heat consumes ten minutes for each patient, and if I should have ten patients each day, or the equivalent, means one day of each week of nearly ten hours for water heating alone, nothing having been said of the sterilizing feature. So much for this.

On the back of my bracket or in some convenient place I have fastened another glass the same as the one before mentioned. In this we can keep boiling water for the instruments, which can from time to time be dipped (or left in) and placed in a convenient place on opposite side of bracket table for further use. The sterilizer is always out of the way and no one need have burned fingers or at any time bump into the hot water or break anything. Should you care to use over, at any one operation, the same small instruments, as clamp, burs, etc., a little dipper which I have can be used for that purpose and can be readily immersed and withdrawn easily and still you have not burned or injured your hands. If you have a bracket which will not accommodate the glass holder, then another convenient place may be secured to place the glass in easy reach.

All that has been said by people advocating sterilization in sight of the patient at the chair can be applied to this sterilizer, and when you have one as simple as this it pays for itself in the first week by time saved. If you feel that the water is not sufficient to do the work then use a germicide to assist the heat.

Five grains of chinosol (kin-o-sol) in a glass of water to be used will prove very efficient in bringing about the desired results. By adding a pinch of carbonate of soda, tarnish of instruments will be prevented.

Understand, I do not offer this as a general sterilizer, but only as a handy article to be carried with you in making calls away from the office and in the office at the chair.

As a water boiler or heater for final cleaning up, which is always taken care of by assistant or office girl, I have another heater for that purpose which can have instruments placed about it in a pan and will heat twice the volume of water in one-half the time that natural gas will do it.

## THE RESPONSIBILITY OF THE DENTIST TO THE CHILD\*

By W. R. Alvord, D. D. S., Detroit, Mich.

THE INTELLIGENT citizen of today is actively interested in the welfare of the juvenile world at large. If he be a legislator, he will favor the enactment of the laws for the betterment of conditions, and influences surrounding the child, that he in turn may be properly equipped to assume the responsibilities of citizenship.

These efforts are successful or fail in ratio to the ignorance of the people. This is especially true in the advancement of dentistry today. This condition has given rise to the thought of this paper—*The Responsibility of the Dentist to the Child*.

The dentist is largely responsible for the attitude of the juvenile patient. I feel very strongly on this point. By proper handling of the situation, the child's conception of what is before him need not be exaggerated or warped, as is so often the case. The operator should never carry the idea that time thus spent is wasted. Bread cast upon the waters of pre-conceived warped ideas and an active imagination will certainly return again.

A child, once having confidence in the dentist, becomes immediately a patient of the best type and will suffer great pain with more fortitude than many a grown up.

With the confidence of the child comes an active interest in existing conditions. *Then* is the time for the dentist to begin his teachings of the child's responsibility to himself, with special reference to Oral Hygiene.

Here again should the dentist, by his personality, give force to his remarks. The average child, five to seven years of age, comes to the dentist with previously formed ideas as to the discomfort attendant upon his visit and with an acute condition as the cause of it. In my opinion, it is malpractice to fail to use the utmost care and consideration in such cases. Let the *comfort* of the child be the ever-present thought.

It is not necessary to impose great pain to give relief to *most* acute conditions, and the future operations will be conducted with greater ease if delicacy and tact be used at the first sitting. Do not look upon time spent teaching the child, or in gaining his confidence, as unremunerative. Children, properly impressed, are forceful advertisers.

Upon relieving the acute condition existing in a child's mouth a general and thorough examination of the oral cavity should be made and recorded. All the surfaces of all of the teeth should be examined, of course,

\*Read before the Michigan First District Dental Society.



but also conditions of the pharynx, with especial reference to tonsils and adenoids.

Adenoids are formed from hypertrophied lymphoid tissue, situated at the upper and posterior part of the naso-pharynx, as we say, the vault of the pharynx. Lymphoid tissue should normally exist in the post nasal space, but by irritation, inflammation and infection, this velvety tissue becomes chronically enlarged, and so obstructs the normal air current. The smaller the naso-pharynx the more it obstructs if hypertrophied. Clinical observations show that adenoids are present between five and eight years of age, if they appear at all, and this is the time when they do the most harm in disturbing the second dentition. Operation is advisable in all cases when adenoids cause interference with nasal respiration. An operation should be made early—before eight years.

*Diseased* tonsils, and in *some cases* enlarged tonsils, should be removed. Here again it is the dentist's mission to warn, guide and inform both child and parent. To be sure, the orthodontist can give marked aid in later years if adenoids and tonsils are unchecked, but in this age of *preventive* dentistry it is the dentist's duty to guide and counsel.

I am often asked by parents, "How early should I begin to care for my child's teeth?" My usual reply is, "About six months before his birth," immediately explaining the necessity of the pregnant mother's care of herself, not omitting the use of lime water with her food.

I explain the need of watchful and persistent care of the child's oral cavity from his birth. The use of the borax solution on the cotton swab, then with the eruption of the teeth the added diligence in the brushing all the surfaces of the teeth, then the necessity of bringing the child early to the dentist, there to learn the proper care of the teeth, that correct habits may be deeply rooted.

In my private practice I conduct the repair of the deciduous teeth much as I would the permanent ones: that is, I attempt to preserve them for the fulfillment of their mission.

As a rule, deciduous teeth are not as sensitive as the permanent set, and for this the dentist is devoutly thankful. Cavities can be properly prepared for amalgam or cement fillings, and this should be done. I find that I am using less and less amalgam and more and more of the oxy-phosphate of copper cement. The oxy-phosphate of copper cement is black but does not discolor the tooth in which it is used and makes a very satisfactory preservative for deciduous teeth. Right here I might say that my aim is not the esthetic appearance, but the hygienic condition of the mouth.

The treatment of teeth presenting an exposed pulp or putrescent condition presents a field for the exercise of ingenuity, patience, and careful study. I never use arsenic trioxide in the devitalization of deciduous teeth. Silver nitrate, saturated solution on cotton, sealed within the cavity of the tooth, will accomplish the painless devitalization of the tooth in about two days. Sometimes the second application is necessary, but not often.

After the pulp is removed the canals and pulp chamber should be filled with a paste suitable to preserve an antiseptic condition of the tooth, and yet one that will not interfere with the absorption of the roots of the temporary teeth. In serious cases, whether they be the result of ignorance and carelessness on the part of the parent or child, or due to systemic or inherent weakness, the greatest care and study should be given.

You all know the constitutional case, for instance, in which perhaps every tooth becomes denuded or partially denuded of enamel as soon as erupted, leaving a peculiar brown color of varying degree, with perhaps just the tips of white enamel on the incisors. Invariably, if left to Nature, these teeth disintegrate with greater or less rapidity with the disgusting result, at the age of three to five years, that they are merely a line of blackened, broken, putrescent stumps, unfit for service, and a source of annoyance and a menace to the health. These cases, too often existing, need heroic treatment. Nitrate of silver is again our friend in this type of cases. Applied in successive treatments, with no thought of the esthetic, the result of such a course is an immediate arrest of the destructive condition and a return of function—but the teeth present an unsightly appearance.

The question of extraction of teeth in the child is one for which there can be no set rule. There are so many “*ifs*” governing the case. The thought of providing and retaining the largest active chewing area should govern extractions in a marked degree.

If a broken-down crown and unabsorbed roots present for care, and the permanent teeth are not yet due for eruption, I open the canals a little, clean as well as I can and put in some antiseptic paste, seal with red gutta percha and grind the roots down to the gum margin. This, of course, providing there is no soreness about the roots so treated, and the patient is one who will return in a few months for examination.

Deciduous teeth should be cared for in such a way that the child has no sore teeth to prevent comfortable mastication. Avoid, so far as possible, conditions which allow the formation of the habit of *bolting* the food. Eliminate all catch holes and jagged edges, and prepare the teeth so that all parts of the oral cavity may be kept in a hygienic condition.

The preservation of the first permanent molar teeth is a vital point in the foundation for a bright dental future. If the six-year molars are abscessed and not readily healed, it is better to extract than to permit an abscess of long duration. With this exception, the extraction of the first molars is contraindicated.

A word bearing on the after effects of proper dental procedure in children:

It has been my pleasure during the last year to examine and prescribe for the mouths of upwards of 500 children whose ages varied from two and one-half to seventeen years.

Many *anemic* children among them increased in health, vigor and weight within sixty days following treatment.

*Cross, fretful* children were markedly improved in disposition.

Brothers and sisters of children receiving treatment have in turn been coached and encouraged in the practice of oral hygiene by the children themselves.

In conclusion, I wish to touch upon that most universal objection to juvenile practice—remuneration. Of course, none of us are in the profession for our health. I base my fees upon the time consumed. With a little pains, you can show the purse-bearer the necessity for and the value of your services to the child, and that again is a responsibility of the dentist to the child.

May I ask my professional friends here present to honor me with a general discussion of this paper—I assure you I would appreciate it.

#### DISCUSSION

DR. ELLIOT: Until we can reach the parents and impress on their minds that the dentist is not to be put in the same class with the policeman and the bougie-man and used as a means of scaring children into good behavior, we have a great deal to overcome in the child's mind. Have you never seen the parents or the nurse girl tell the patient, "If you don't hold still the doctor will pull your tooth?" I have, and that is just the time to gain the confidence of the little one and deliver a lecture to the parent. I think it is a good plan even to exclude the parent from the operating room.

Dr. Alvord speaks of adenoids and their evils. I believe that the duty of every dentist is to watch for indications of such and not only to warn the children and parents but to advise seeing a specialist at once.

The essayist says he uses cement to fill deciduous teeth. There are men who advocate gold and amalgam almost altogether. I must confess that I resort to cement very often. I can see no objection to arsenic trioxid if not left in the teeth for more than sixteen to twenty-four hours. I have not tried the silver nitrate; no doubt it is effective.

I will say, in closing, that I believe just as soon as the dentist learns to be just to himself and is not afraid to charge the same per hour for the children's work as he does for the parents, the juvenile world will receive better attention at his hands. If any one present has not been out to Grace Hospital and seen the manner in which Dr. Alvord handles the little patients, he has a lot to learn.

DR. WATSON: I did not intend to discuss the paper, but since you have called on me there are a couple of points that I would like to enlarge upon slightly. The essayist has called your attention to the need of having the naso-pharynx examined, and told you that if adenoids were found obstructing the air passage—they should be removed before the eighth year. I am sure he will fully concur with me when I tell you that they should be removed as soon as they become pathological, whether the child is one, two or eight years of age.

The doctor also referred to the influence of orthodontic interference, through work done on the permanent teeth. It is, of course, true that we are able to stimulate marked developmental activity through applying pressure to the permanent teeth, but I believe the orthodontist has a far greater usefulness in dealing with the deciduous dentition. If for any reason the development of the internal face has been interfered with—and, by the way, it is well for you to know that there are numerous things that do interfere aside from enlarged tonsils and adenoids—it is possible to stimulate the development of these parts through applying gentle, very gentle, force to the deciduous teeth. You will readily understand that if it is possible for us to renew developmental activity at four or five years of age, a development which has been interfered with for only two or three years perhaps, and succeed in gaining normal growth from that time on, the good to the patients must be infinitely greater than if the lack of development continues for



several years and later on, say at 12, 13, or 14 years of age, we try to make good the loss of these intervening years. To return to the subject, however, I would simply urge you to examine the naso-pharynx, or, better still, have it examined by the rhinologist if there is the slightest reason to believe that there are any pathological conditions present. If, by removing obstructions and restoring normal breathing early enough, you are able to stimulate a normal development of the jaws, you will—in all probability—prevent any need for orthodontic interference.

DR. WICKS: I am a Methodist, and the Methodists are strong on testimony. Sometimes these testimonies take the form of a confession as to sins of commission and sins of omission. I am frank to confess tonight that I am in the spirit of that testimony of omission, and I believe if every one of us would be perfectly honest with ourselves we would confess to the sin of omitting our duty in regard to the child. I know this from my personal experience, and we judge others largely in proportion to our knowledge of ourselves. In my former practice (and this was more particularly true in my earlier practice—I find I am coming up a little as time goes by) I was inclined to treat the little one sort of temporarily, get rid of the present trouble as quickly as I could and get the child off my hands. We all know it is no easy matter to handle the child as we would an adult. The adult is supposed to have sense enough when we come to a sensitive tooth to submit to the operation, if we are careful. But the child is different; he or she is not capable of enduring the pain that the adult is, and it is oftentimes quite difficult to get the child to submit to an operation where pain is incident, but I believe it is—in fact, I know it to be—true that if we are careful with the child, as the essayist has suggested, at the first sitting, so as to gain the confidence of the child, if we do nothing but simply alleviate the pain, that we have done a great deal toward insuring the future confidence of the child, and we should proceed with the operation as carefully at subsequent sittings as we possibly can, and thereby increase his confidence in us as we progress with the work.

In many cases, as Dr. Elliot has suggested, the parents are responsible for the attitude of the child toward the dentist. They go to the dentist, and go home, and in the presence of the child they tell of the pain endured, and how much they fear to go to the dentist. The parents should be educated to keep these things from the children; even though they have suffered untold agony at the hands of the dentist, let the child go in ignorance, and let the dentist educate the child, or at least lead them to believe that the dentist is a human being and wants to help them rather than to hurt them.

Now the question of filling teeth for the child sometimes is a perplexing one. They come to us with badly putrescent temporary teeth, so badly decayed sometimes we find it absolutely necessary to extract when they come to us. In these cases, if the space has been preserved up to the time they present for treatment, it is the duty of the dentist to preserve that space in some manner or other by constructing an artificial appliance—a band, for instance, on one or two teeth, a bar between—in order that the permanent incoming tooth may have room when due to erupt.

Devitalizing by silver nitrate I never have tried. It is a good suggestion. I prefer the arsenic fibre in treating these little teeth, and have had good results from that; but for filling the root canals, my personal experience has been that gutta percha gave the best results. I have tried the various kinds of paste that I have made from articles that have been put upon the market, and my experience has been that gutta percha has given the most uniform and gratifying results.

I heartily concur with the statements that our essayist has made in regard to other points touched upon, and I think that the dental profession still needs education along this line. I am sure all of us have cases come to us occasionally from other dentists where it looks as if somebody has neglected the children, and I don't believe we are wide awake yet to the real needs of the little one and the attention it should have. I know the question of fees is oftentimes the question we raise. We feel that we can make more working for the adult, but I believe the services rendered the little one are

worth even more than the services rendered the adult. When we come to the point where we will make adequate charges for such cases, I believe the little one will benefit as well as the dentist.

DR. BUTTRICK: There was one point in the paper that I do not think was put exactly in the way that I should have liked to have it put. It seems to me that the extraction of a "six-year molar" is *indefensible*, except as a last resort. The essayist said, if the abscess would not yield to treatment, extract the tooth. I think if the abscess will not yield to treatment we should treat it again and again, and yet again. There are very few abscesses that will not yield to proper treatment. When you take a "six-year molar" out of a dental arch you spoil the mouth absolutely for all time.

Another point suggests itself to me. I should be a little bit careful about diagnosing a case as having adenoid tissue or a hypertrophied tonsils. When you see an evidence of mouth breathing and lack of development, if you make a snap-shot diagnosis and say there is something to be removed, you may have some embarrassing explanations to make to the parents afterwards. The lack of development may be due to some other cause.

DR. STRAITH: For some time my conscience has been quite clear on the subject of extracting six-year molars; for I do not think I have extracted one, on my own responsibility, for a good many years; I have extracted some when, if it had been left to me, I do not think I would have done it; but probably not very many.

There is one phase of the paper I would like to touch on. The subject is, "The Dentist's Responsibility to the Child." I think that should have been extended to include the parent, when possible. It would hit some of us a good many times when we little heed the prod. Most of the children who are brought to us, or to you now, I will say, usually are accompanied by parents, at least the first time, and I do not think there are many of you who have not heard the same remark in your office that I hear in mine nearly every day; they indirectly teach their children to distrust us and to be afraid of us; the child is told that we are not going to hurt him, and then when it comes to us the parent, by misrepresentations and by absolute falsehood, leads the child to believe that we are going to do something the opposite of what we will do. I know I have often lost patients because I absolutely refused to allow the parents to misrepresent to the child what I was going to do. They come in with the child for my work and say to him, at the same time winking at me, "Now, he is just going to look at your teeth, he is not going to do anything," or possibly "He is just going to put in a little cotton," and then give me the wink to extract the tooth. Now, at that time I say to the parent—I have said it more than once, and say to them now, "If I do anything for this child he is going to know what I am going to do. If I am going to extract this tooth the child will know it, and you cannot deceive him in my office." If we would all act similarly, I believe the children would have a better opinion of us and would grow to respect us more and to fear us less if we were fair with them.

DR. WOOD: I wish I had more children to work upon. I sometimes enjoy filling their teeth; sometimes I do not. I have made a practice for years of putting in, when I was fortunate enough to have an opportunity to work upon the children, permanent fillings, that is, silver fillings, in the molars, for instance, and contouring them as best I could under the circumstances, depending on how much interested the child was in having that done. I have always been very much gratified in after years that I did that. I contour them to meet the adjoining teeth so they cannot pack everything in between and cause them undue annoyance in eating. But there are many cases where the child will not permit of so permanent work or so extended work, and in these cases I have had great satisfaction with Ames' Copper Cements. It is wonderful what this material will stand and how quickly and easily it is put in, and it lasts almost as well as the metal filling.

I would like to ask Dr. Alvord what he uses as a paste for filling those roots. I think that is quite important. I have had good success filling with gutta percha points

those deciduous roots. I have sometimes used antiseptic paste, covering with gutta percha, gently pressed down. The best way is, when we have the opportunity, to fill these deciduous molars so perfectly that the pulps will remain alive, for I believe a vast amount of disturbance results to permanent set from lack of absorption of these pulpless temporary molar roots. The idea of "casting bread upon the waters," as Dr. Alvord puts it, is a good one. I think we can spend a great deal of time profitably in talking to the children and explaining the different parts of our work, especially in showing them how to take care of their teeth. The work Dr. Alvord is doing at the hospital, with the assistance of our members, is very important and far-reaching and will result in great and lasting good to the community.

We have with us tonight, as we usually have, three ladies who, I believe, put in a large part of their time in handling children, particularly in prophylaxis work. Now, we don't often have a chance to hear from them, and I think this is the opportune time to hear from the ladies of our profession. I would very earnestly ask the ladies to discuss this paper.

DR. PAGELSON: I want to say that I enjoyed Dr. Alvord's paper as much as I did seeing him work in the clinic. I think I never saw any one handle children as he does.

I agree with Dr. Elliot in excluding the parents from the operating room, not that I have, as Dr. Wood says, a large proportion of children in my practice; but I should enjoy having a great many more, because I think children, if they are rightly handled, are more reasonable than most grown people. If you get the confidence of the child in the beginning you always have it, and you can hurt them a great deal as long as you talk with them and show them it is necessary. I think I had that impressed on me very strongly in the beginning of my practice. A child was brought in to me by her mother to have a tooth extracted. I asked her to open her mouth, and said, "I won't hurt you," and she said, "That is what the other dentist said, and he did." I think that attitude of deception to the child is a wrong one to take at any time. A dentist can do more with them if they are treated reasonably than any member of the family. I know a bugbear of the children is that they are going to get hurt by the dentist. Quite a few children are hard to deal with, but it can be educated out of them if they are handled accordingly.

DR. O'REILLY: I believe one of the most difficult problems in the treatment of the deciduous teeth is the successful filling of root canals. Some five years ago, when discussing this subject with the late Dr. Y. J. Collins, he referred to the possibilities of surgeon's catgut as a substitute for the gutta percha point. I then adopted it and now use it in conjunction with a paste of my own manufacture. It consists of a powder containing equal parts zinc oxid, burnt alum and paraform, mixed as you would cement, using formalin, alcohol, creosote and oil of cloves as the liquid. I first work this paste into the root canal and then insert the catgut point.

The theory in the use of the catgut is that as the root absorbs the canal filling also absorbs, thus we do not have any foreign substance to set up an irritation. This treatment has been successful in many cases, but again the results have been disappointing. The question is whether to attribute failure to the paste, the point or to faulty manipulation.

I would like to hear from the essayist as to whether he has ever tried the catgut point, and if so with what results? Also what is the formula of the antiseptic paste he mentions?

DR. OAKMAN: There are several good points brought out in the discussion, and I was very much pleased with the essayist's paper, because I heard before I came here tonight that he was quite successful in handling children. We know, from experience, when we are successful with children it means much; if the child is properly handled in the office his future visits will not be dreaded if you do nothing but put a little medicine in his tooth and let him go; if you have to hurt him, let him know it is coming. Years



ago we were taught by some to carry a forceps up our sleeve and have the child open his mouth and grab the tooth. You can reckon that that child will never walk on the same side of the street if he sees you coming.

Now, I believe in being honest with children and not taking advantage of them just because they are children, and we are possibly able to deceive them if we so desire.

Somebody spoke about fees. As far as I know, if you called a physician into your family to treat your child, when you get your monthly statement you will find that it cost just as much for that visit as if he treated an adult member of your family; you wouldn't expect him to come for less, and he would not, and does not; and why should we, as professional men, give up our time to the care of children's teeth if it is going to be a financial loss?

I am surprised that no one has spoken about putting inlays into children's teeth. For some time past I have been putting gold inlays into children's teeth with excellent results. When you see children four or five years of age—these molars are supposed to be there four or five years, and any filling that will last five years in a child's tooth is well done. My experience with other filling material is that on the occlusal surfaces of teeth, where you can, with delicate manipulation, remove decayed substances and drill on the occlusal and get retention, you can insert a gold inlay with more comfort to the child. Should an inlay come out it can readily be replaced and the tooth preserved.

Speaking of silver fillings, I try to discourage in my patient the use of the words silver fillings, which is not used by correct dentists and sounds much like the advertisements which commercial dentists use. I try to induce them to use the term amalgam when they want to make the word explicit. Patients come to me and say "this six-year molar is decayed." The tooth may have come in at six or maybe seven years of age. The term "six-year molar" should be discarded. The tooth may have come in at six, it doesn't imply anything; it is not a six-year molar in any case. The tooth may be only a few months old as far as a visual examination goes.

I think Dr. Alvord, in using silver nitrate, is using a splendid agent. While I think we all use it in permanent teeth, it is no doubt as valuable an agent in temporary teeth.

DR. STAFFORD: I haven't any knowledge to give out, but I would like to ask a question or two about some of these things.

Is it a fact that in the deciduous teeth, after the pulp has been destroyed, the roots absorb? Does it do any good to put something in that will absorb?

The catgut may be a good root filling, but it is my experience, I think, that when the pulp is taken from a deciduous tooth and you have to extract that tooth afterward, you will find the roots just about as long as they were when you filled them, and that the absorption of the root of the tooth is very small after the nerve is killed.

Another thing I want to speak about is, if you find that you must extract one of the first permanent molars, should you extract the one on the opposite side, or should you extract all of the first permanent molars, provided the others could be saved readily? Must you, if you extract one, extract the rest, or the one on the opposite side? That has often been a question in my mind. I always try to save them all, but sometimes they come to you split in two, down to the bifurcation of the roots, when you must take them out, and should you also take out the one on the opposite side, I would like to know.

DR. ALVORD (closing): I object to the use of arsenic trioxid on account of the size of the canals. I am not sure just how far I am putting it down there, and I am mighty sure that at that age the tissue changes very rapidly. I have had trouble; perhaps others have not. I am not condemning it for other people's use; I think no one dentist can tell another man how to work—he may relate his own experience only.

Now, I would like to speak about one particular objection to the use of arsenic, and that is the return of the child. If you are dead sure that you will see that child again, I can possibly sanction it under certain conditions; but you don't know if that

child is going off on a pleasure trip or if you have scared him to death; you can't tell, and the chances are that the next appointment for the juvenile patient is a very precarious one.

In regard to excluding the child's parents from the operating room, I think that there is no set rule. We come across a great many children you could not do anything with, without the parents there, and, as an average, I find that your influence over the child is quite as great if you impress the parent with the fact that you know your business. I was recently dictated to by a parent, "Now, thus and such is the case, etc., and I don't want this and that." I said, "When did you study dentistry, where was it?" Well, she didn't have anything more to say, and the child was interested because of the little discussion in which the parent shut up—it must have been a novel occasion to the child.

I would like to say that in writing this paper I did find it very difficult to separate the responsibility to the child and the responsibility to the parent. They are practically interwoven, but I didn't suppose I could have much to say to you about your responsibility to the adult, and merely called to your mind what might be your responsibility, or rather, what I judged to be our responsibility to the children.

I value very highly any correct association I may have with the allied professions—rhinologists, for instance, or the M. D. Now, I very frankly tell physicians that they don't know their business when they come to look into the mouth, because I see mouths after they have, where they have not spoken to parents of the existing conditions, either of the dental arches or of the pharynx, and I think it is our duty to the physicians, if I might be so bold as to remark, that we attempt, where we can without too much opposition, to suggest that our brethren of the M. D. join us in instructing the parents in the development of the child, of which I consider the oral cavity no small part.

Of course it is a very fit subject for discussion, the resorption of roots and the root fillings. I have said what I do; I do what I can. Now, very often the child will let you open up the canal and put in some kind of an antiseptic paste. All pastes you cannot handle in the same conditions, you know. As a rule, you can get in an antiseptic paste; Dr. O'Reilly, I think, has a very good one. I have used zinc oxid with oil of cinnamon and formaldehyde—of course the cresol with the formaldehyde—and use the oxid as a vehicle to carry it. Now I think perhaps the cinnamon smells good to the child and is not objectionable, while the formaldehyde and cresol odor, while it is only partially covered, is obnoxious to him.

I am very much in doubt as to the resorption of the roots. I hoped to learn from your experience tonight, and I think perhaps I have; but you have all failed to say whether the roots absorbed, and I suppose you don't know any more about it than I do; but, in my humble opinion, the roots do absorb after they are filled. Now, I don't think that they necessarily absorb on the point in contact with the incoming tooth; I think probably there may be no more absorption on those surfaces, but that the absorption is around the axis of the root. Now, I extract a great many teeth at the Free Clinic, and I find very often an absorption of the root, right straight around the root all the way up. Why is it? I don't know. I merely mention that that condition exists. Now, the normal absorption of the root, of course, is just as the permanent tooth pushes up in between the roots and demands that they get out of the way. That I suppose to be a normal condition, but if a deciduous tooth is devitalized I suppose that that absorption is certainly retarded, and whether it goes on as it did originally or whether it changes form and simply absorbs around the axis I don't know, but I know that I have extracted a number of teeth that I filled with gutta percha and found that the points were ridiculously far past the end of the roots. Perhaps I was altogether too hungry in filling the teeth, but there was no complaint from that source at the time. I therefore drew the conclusion that there is an absorption. I have used catgut as a canal filling, but am not using it now; I had probably not wisely used it, for I had trouble, though not in every case by any means. I had several very fine cases that turned out all right, but I had objections resulting, probably, from poor management on my

part. I would like to say this on the extraction of six-year molars: I intended to make it strong enough, "that with this exception the extraction of six-year molars is counter-indicated." I did not have time to tell all I knew about six-year molars. I am a six-year molar crank. I call it "six-year molar" because that is the way the mothers speak to me. I regret my mistake and apologize to the society for my nomenclature, but that meant business to me and it meant business to the mother, so I referred to it as such.

When did you see the molar? If that molar is too far gone so that you cannot save it, then it is to be extracted, of course, but if it fails to yield to treatment—I did not mean one treatment, I meant any number of treatments that in your judgment was the requisite number, and according to your skill, or the skill of any one to whom you might refer that six-year molar. I cannot save every six-year molar, but I will fight for it. I have not extracted a six-year molar since I had charge of the Free Clinic at Grace Hospital. Occasion may arise, but not yet.

One point on the deception of the child. Nothing like that in our family. When the child comes into your office you are to him just exactly what you make yourself. Now, I make no exception to that statement. If you have not personality enough to impress that child with what you can do, then the child ought simply to look over your goods and go on home and not come back again. If he has the toothache, you are awfully sorry, but he has to bear it as a punishment for not staying there and taking your medicine; that will appeal to the child, if you put it to him right. I don't know of any more logical mind than a little child's when you attempt to give him a reward. I tell you, any time you fool a child, you don't. No matter how difficult it is, if you once stick to it until you get that child on your staff, you have a mighty good patient.

I personally have had only six cases in which I have used inlays. I was not bright enough to start that until a little while ago, and have had good results. Of course the fees would govern that somewhat. However, I have done some of it from an experimental standpoint, and so far they have been entirely successful. I value the retaining of the interdental spaces, but I more value the ability to get hold of that child every two or three months. Now, I grind down the teeth and I grind down the cavity borders and grind down anything nearly, so that I can get a surface that does not give a sore chewing surface to the child. I think it is a fierce habit for the child to get the idea that he cannot chew his food. He won't complain very much, and there again comes another trouble. Your diagnosis has to be largely objective. You have to size things up as they exist, not from the complaint of the child. They cannot tell you exactly what is the matter. It is a difficult matter to diagnose the cases.

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## WHERE THE DENTAL SURGEON AND RHINOLOGIST MEET\*

By Adolph O. Pfingst, M. D., Professor Rhinology, Laryngology, Otology, and Ophthalmology, University of Louisville Medical Department.

THE CLOSE relationship between diseased teeth and pathological conditions elsewhere in the body is being recognized more each year, and we are learning to appreciate that the study of dental diseases and their treatment is but a branch of general medicine. It has long been known that constitutional diseases, as well as local pathological conditions, have a direct influence on the condition of the teeth. Examples of the former are not uncommon, and we have all seen cases of ricketts with the characteristic retarded development of the primary teeth and the chalky character of the permanent set. We have also had occasion to note the

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\*Read before the Louisville Odontological Society.



deleterious effect of inherited syphilis upon the teeth, causing delayed dentition and the characteristics of the permanent set, such as dwarfed teeth, erosion of the enamel and the peculiar cupping of the cutting edges of the central incisors described by Hutchinson. Some of us have seen cases of crettenism, and the delayed dentition and dwarfed teeth associated with this disease. In later years the dental profession has also become more familiar with the influence of local conditions on the teeth, until today every dentist is familiar with the changes in the upper jaw and secondary irregularity of the teeth brought about by nasal obstruction, and especially by the presence of adenoid growths in the naso-pharynx.

While such relations between constitutional and local disease and the teeth have been recognized for some time, it has been of comparatively recent years that the medical profession has realized the influence of the teeth on the general health. Not that the profession was not familiar with some of the troubles of babyhood occurring during dentition, such as deranged alimentary tract, convulsions, earache, eczema, etc., but the association of dental caries, delayed dentition, etc., with constitutional disease, was overlooked.

I am free to confess that the medical profession has, until recently, been profoundly ignorant of the many conditions which may result from dental caries and sepsis. This can be explained in the fact that we have looked upon the teeth as something out of our province. Nothing has done so much to awaken the interest of the profession to this subject as the inspection of the teeth of school children. When such examinations were inaugurated in our city I was very skeptical as to the ultimate benefits that would accrue from it, but since I have learned that a large proportion of the school children here and elsewhere in this country, and in the tooth clinics abroad, were found to be afflicted with oral sepsis, I feel convinced that the advanced conservative treatment of the teeth will have a marked influence in lessening disease.

The medical profession recognizes now the far-reaching effect of a septic mouth and that a discharge from or around the teeth may lead to intestinal disturbance, chronic auto-intoxication, malnutrition, anemia, etc. It is also known now that inflamed pulp has caused enlargement and at times suppuration of the cervical glands. Tuberculous infection of the glands of the neck through the pulp cavity has also been reported.

Direct extension of disease from the teeth takes place most frequently into the antrum of Highmore, and as infection of this cavity also takes place spontaneously and through the nose, I believe that we can look upon this cavity as a link of connection between the operative fields of the dental surgeon and the rhinologist. Owing to our joint interest in this cavity, I have decided to discuss tonight empyema of the antrum of Highmore; however, I will endeavor to confine myself as nearly as I can to such features that would be of most interest to the dental surgeon.

There is, as you know, much diversity of opinion as to the cause of empyema of the antrum of Highmore. You, gentlemen, who see only those

cases of dental origin would naturally conclude that the greatest number of abscesses are caused by an extension of the inflammatory process from the root of a carious tooth or its surroundings. However, the majority of investigators, including anatomists and pathologists, are now of the belief that a genuine inflammation of the antrum occurring primarily or extending from the nose during influenza, coryza, or kindred affections, is more common than inflammation resulting from carious teeth. Zuckerkandle, one of the most thorough pathologists of Europe, found evidence of a dental origin of antral disease only a single time in 300 autopsies, while E. Frankel found it twice in 146 autopsies. On the other hand, clinical reports of Grunwald showed that in 98 cases antral abscess, 14 were of dental origin. In 200 cases reported by Hajek, 13 were of dental origin. Although the proportion is not as great as those of Zuckerkandle and Frankel, the dental cases still furnish but a small percentage of the cases. Yet we know that it is not uncommon for tooth roots, especially of the second bicuspid and the first and sometimes the second molar, which so often extend into the antrum or are separated from it only by a thin lamella of bone, to become diseased and by an extension of the inflammation cause empyema of the antrum.

While it would be out of place for me to attempt a detailed account of the various affections of the teeth which cause disease of the antrum, I wish to point out the recognized dental causes of antral disease. Of those, the most frequent is abscess of the alveolar periosteum, originating in a carious tooth. The avenue of infection may be opened by extraction of the diseased tooth, or the pus may break into the antrum spontaneously. The possibility of infection is necessarily greatest where the root has projected into the antrum. Abscess in the root itself is another frequent cause of infection of the maxillary sinus, the pus extending along the nerves or blood vessels until it finally breaks into the cavity.

Of the less frequent dental causes of antral abscess, I wish only to mention retained teeth and cyst formation, either of which may invade the cavity and infect it. Empyema of the antrum is most frequently the result of gripe and acute coryza. It also follows primarily during the exanthematous fevers, or may occur as a sequelae to them. Antral infections occur after nasal operations, the use of nasal douches, placing of nasal tampons and, in children, to foreign bodies in the nose. Less frequently the antrum is infected by extension bone necrosis of syphilis, tuberculosis or osteomyelitis. It may also result from injuries and from the development of malignant growths. It is of importance that we make a sharp distinction between the acute and chronic cases, as they differ no little in their prognosis and indications for treatment. It is not new to you that the acute cases offer much better chance for ultimate recovery—usually without an operation—than do the chronic. The pathological changes are similar in the two varieties, the mucous membrane being infiltrated and swollen, and the cavity containing pus or muco-pus (chronic cases). In

the chronic cases of long standing, there may be marked thickening of the mucous lining of the cavity, and frequently the cavity is partially or completely filled with polypoid masses. Abscess of the antrum usually occurs only on one side.

The subjective symptoms of antral abscess are referred principally to the affected part, although such general symptoms as fever, increased pulse-rate, lassitude, and sleeplessness, are not uncommon. The local symptom perhaps of greatest importance is the discharge of pus into the nasal passages of the affected side. In those cases of periosteal abscess which have broken into the antrum, the discharge is characterized by the suddenness of its onset. In nearly all acute cases a discharge from the nose is complained of. In the chronic variety the patient may complain of a "constant cold" or of "catarrh," owing to the abnormal discharge from the nose. The pus frequently dries and accumulates as crusts in the nose in chronic empyema, giving the patient a feeling of dryness in the nose and throat, and a frequent desire to rid himself of the irritant by hacking and spitting. Again, instead of coming forward the pus may, on account of hypertrophy of the nasal passage, in front of the maxillary opening, flow backward into the naso-pharynx. The sense of smell may be considerably impaired. Pain is present in nearly every acute case, the patient complaining of a feeling of tension and of a dull pain over the region of the maxillary sinus, exaggerated by pressure and often accompanied by periodic neuralgic pains referable to the face or upper set of teeth. The teeth at times are sensitive to pressure and may give the sensation of being too long in closing the jaw.

The chronic cases are frequently accompanied by pain, but the pain is not continuous as in acute cases, assuming more of an intermittent character.

The various other local subjective symptoms, such as frequent occlusion of the nasal passages, nasal hemorrhage, and the like, although frequent, are not characteristic of antral disease, as they are not infrequent when the antrum is normal.

The objective symptoms of empyema of the antrum correspond more or less with the symptoms just enumerated. The presence of pus in the middle meatus of the nose, even after recent cleansing of the passage, is one of the most constant symptoms of antral abscess and one of the most reliable diagnostic signs. However, do not let me convey the impression that inspection of the nose will in every case reveal pus coming from the region of the maxillary opening.

Hypertrophic conditions or deformities may obstruct the nasal passage so that it will be impossible to determine from which of the accessory nasal sinuses the pus is coming. Again, the pus in the antrum may not reach the level of the maxillary opening, in which case the meatus would contain no pus. Hypertrophy of the mucous membrane or polypoid formation in the middle meatus is so frequent in chronic empyema that such changes



should always be looked upon with suspicion. Pain on pressure, a frequent symptom of the acute cases, is not noticed in the chronic variety except it be during an acute exacerbation. Along with tenderness there may be swelling of the soft parts over the canine fossa, but it is exceptional.

From what has been said, it is evident that in typical acute cases of empyema of the antrum, which are ushered in by a chill and fever, and are characterized by pain and swelling over the maxillary sinus, and accompanied by a discharge of pus into the middle meatus of the nose, the diagnosis is comparatively easy. The same is true where a clue to the diagnosis is given by a history of alveolar periostitis, or of the extraction of a diseased tooth near the antrum. The symptom of greatest importance is the flow of pus from the maxillary opening, and without this the diagnosis is more or less doubtful.

In the chronic cases, and especially where, on account of mechanical obstruction, it is not possible to determine from which of the accessory nasal cavities the pus is coming, it will be necessary to resort to other means of establishing a diagnosis. One of the best of these is irrigation of the antrum. By using a bent canula, this can in a very small percentage of cases be accomplished through the natural maxillary opening. However, the operation is by no means easy, and even in experienced hands is often unsuccessful.

Failing in this, irrigation is readily accomplished through a canula thrust into the antrum from the nose. The best instrument for this purpose is a curved trocar and canula. Under cocain anesthesia it is thrust through the thin wall separating the antrum and inferior meatus close under the inferior turbinated bone, about an inch from the nasal meatus. After withdrawal of the trocar a warm normal salt solution is injected through the canula with a syringe, the solution flowing out through the natural opening. If the fluid contains pus, the diagnosis of antral abscess is made certain.

An adjuvant was added to the methods of diagnosis of antrum disease some years ago by Heyring in the trans-illumination. With the patient in a dark chamber, holding a small electric light in the mouth, there is often noted a difference of the two sides, showing a dulness of the affected side, especially at the lower margin of the orbit. The method was at first hailed as a certain means of diagnosis, but experience has taught us that it is not always to be relied upon. Even though one antrum contains pus, both sides may appear equally illuminated, or at least very nearly so. Furthermore, it has been noted that with the antrum of both sides normal, one side may appear considerably darker than the other on account of asymmetrical conditions of the bone. Only where the difference in the illumination of the two sides is pronounced can much reliance be put in this method of diagnosis.

In late years skiagraphy has been introduced as a diagnostic measure in diseases of the nasal accessory sinuses. While it is true that in abscess

of the antrum of Highmore, the difference in the two sides is marked, the plate showing an ill-defined boundary instead of the well-defined boundary of the healthy antrum, still we do not employ it as frequently as in the diagnosis of abscess of the frontal sinus or ethmoid cells where the diagnosis by other means is more difficult.

In considering the treatment of abscess of the antrum, I will give the acute cases but a passing mention. Most of the cases, coming as they do as a complication of influenza or acute nasal inflammation, yield to nasal treatment consisting in a reduction of membranous swelling with adrenalin solutions, frequent cleansing with antiseptic sprays or the application of argyrol in solution to the nasal passages. In treating the chronic cases, the primary object should be the removal of the cause and then the establishment of free drainage. The first indication can be fulfilled most readily in those cases attributable to dental causes where the offending carious tooth or diseased bone may be removed. It is not new to you that instances are on record of rapid cure following the extraction of a diseased tooth, or the opening of a periosteal abscess or removal of necrotic bone followed by antral irrigation. There was a time not so long since when failure to cure by this simple method, gold tubes were introduced through the alveolar cavities and anchored to neighboring teeth for permanent drainage. However, today, owing to advances made in surgical treatment of the nasal accessory sinuses, we are usually able to bring about a radical cure.

Those of nasal origin not yielding to simple nasal cleansing can frequently be cured by puncturing the naso-antral wall of the antrum and irrigating the cavity daily, the irrigating fluid flowing out through the normal nasal opening under the middle turbinate bone. Failing in this antral irrigation through the alveolar process or in irrigation by the nasal route, we have two radical operations to choose from, the nasal method and the operation through the canine fossa.

I wish especially to speak of the intranasal method, believing that in those cases in which the antrum is free of granulations and polypoid formation it has decided advantages over the operation through the canine fossa. The operation, in brief, is as follows: After cocainizing the inferior turbinate bone and the anterior  $1\frac{1}{2}$  inches of the inferior meatus of the nose, the anterior  $\frac{1}{3}$  or  $\frac{1}{2}$  of the inferior turbinate bone is resected (we find some cases with atrophic bone and large nasal space where the bone can be left intact). An opening is then made in the naso-antral wall with a large trocar—a chisel or drill (I employ for the purpose a drill and dental engine). Using the hole as a starting point, a large portion of the median wall of the antrum can be removed with punch forceps. This leaves a large, permanent opening for drainage, so that at every effort of blowing the nose the cavity is cleared of its contents, and in cases with alveolar fistula allows this to close. In addition to allowing free drainage, this operation has the advantage of simplicity as compared with the other operation, being carried out painlessly under a local anesthetic. It leaves no visible wound, requires little or no after treatment, and does not expose the

cavity to reinfection from the mouth or to the aspiration of food or the buccal secretion into the cavity.

A certain number of cases of chronic empyema of the antrum in which polypoid tissue is known or suspected to exist in the cavity will have to be operated upon through the canine fossa to allow more thorough inspection and curettage. The operation was introduced by Lamories, but was perfected by Küster. Preferably, under a general anesthetic, an incision is made one-fourth above and parallel with the margin of the gums from the canine to the first molar tooth. The soft parts are lifted and retracted and the antrum entered through the canine fossa with a chisel or drill, a large section of bone is removed with rongeur forceps and the cavity curetted. The cavity is packed with gauze every day until it granulates, when the wound is allowed to close. In severe cases this operation, combined with an intra nasal opening (Caldwell-Luc), becomes necessary to insure a cure.

### THE IDEAL METHOD OF CONSTRUCTING CAST ROOT COPINGS\*

By A. W. Tatham, D.D.S., Detroit, Mich.

**D**ETAILED description of any particular form of crown is properly preceded by a few general considerations relative to this subject, so rapidly gaining in the attention of our profession generally. The principle of reinforcing wax patterns for castings is applied most practically to root bases for any form of crown, whether it is anterior all-porcelain with inlay setting or a posterior bicuspid or molar used either as a single restoration or abutment for bridge. Some forms of crowns lend themselves more easily than others to this method. Let us consider first the anterior inlay setting. A perfectly non-impinging coping is, be-



yond all dispute, the thing to be attained, and may be by the following technique:

Prepare the root end, making a well-defined bevel, and upon the root place a small strip of mesh—push pin through and trim to approximately the proper size of mesh to be used.

Now remove and run some hot wax upon the upper side of mesh, replace upon the root, and with a piece of soft red rubber such as is used for pencil eraser, force mesh and wax down upon the root. Special emphasis is laid here upon the use of the rubber, because nothing else will so

\*Given as a clinic at the Ransom & Randolph Dental Fair, Toledo, May, 1912.



easily and surely enable you to force the waxed mesh well home and slightly over the edges.

Take this pattern off, turning the inside upward, and you may find that a little more wax is required. If so, run in just a surface, or, with a hot round burnisher, remelt the whole inside. While this is warm, re-adapt thoroughly to the root, using rubber again. The slight margins may now be very easily and accurately brought to place by the use of a slightly warm flat burnisher. Trim this pattern, as you would a band, to suit the case in hand. Toward the labial side nearly all of the coping may be trimmed off for aesthetic reasons. Replace the pattern as many times as is necessary and bring margins to place. To warm the pattern for these re-adaptations, drop it into warm water, or move it to and fro over a flame until uniformly warmed through.

The next step is to place the crown upon the top of the root base pattern, and this is easily accomplished by warming the upper portion of



the pattern while it is on the root, with a hot air chip blower. If wax is insufficient, run a little more over the surface. The tooth should be slightly warmed to prevent too sudden chilling of the wax. Thus it is readily seen a very thin wax impression, with a slightly turnover edge for coping, may be manipulated with surprising ease and accuracy. This coping will fit when cast and give uniform results.

The foregoing technique is employed where a pronounced band or margin is required. The following technique will be found very efficient where no extensive margin or turnover edge is essential:

Place a little warm wax upon either side of the mesh, with a pin push through. Place the porcelain crown upon the pattern and force the reinforced pattern down upon the prepared root. The edges can be brought up with a warm instrument. The pattern can now be trimmed with scissors to suit the case in hand; re-warmed and further adjusted until the crown is forced down to an extremely thin pattern labially; margins are

then brought up accurately with a warm spatula to form a slight turn-over edge.

It must be quite apparent to anyone having made these patterns, without reinforcement, the number of difficulties encountered. One of the most annoying troubles in forcing down this pattern is the *splitting* or *spreading* of the wax—to say nothing of the lack of slight *turnover*, which is wholly absent or inaccurate. This, to my mind, is one of the most important uses of the mesh, as the forming of an accurate and aesthetic adjustment of the anterior porcelain crown every operator is compelled to face. This operation is rendered practical and easy by the aid of the mesh.

#### CROWN BRIDGE ABUTMENT

Let us consider a type of crown for crown bridge abutment. The waxed mesh base is practically the same as for the base described above, except that the pin is bent over at a right angle—also that some roots require a definite band. Make this band by extending the waxed mesh and trim as you would in forming a metal band. Note at this point a most important feature of Gold Mesh, i. e., it does not buckle; it is woven, therefore pliable, giving in all directions, and may be placed upon the root and extended some distance as a band without the annoyances encountered in continuous metal.



Select a tooth of the Goslee type, or Steele's Facing, all-porcelain type, since these give the V-shape slant or space necessary for adjustment and surface for soldering the dummy teeth in for bridgework. Here is a means for adjusting the tooth directly in the mouth in most cases without casting the root base separately—eliminating running of models, etc. The mesh is placed upon the tooth, hot wax run upon the mesh; pressed to place quickly; taken off the tooth; re-trimmed and re-adapted in the same manner as a root base impression. These two patterns are now ready to be attached. The point is that the mesh upon the tooth, the tip end for attaching, may be heated and attached at any angle or removed as often as is necessary, and when finally articulated, the porcelain tooth, by reason of the mesh reinforcing pattern, may be easily taken from the pattern without distortion.

Furthermore, the mesh-wax patterns are unlike those with a continuous metal backing, because they can be re-shaped or changed readily. The enmeshing qualities, ever present in adjustment, render it possible to

achieve through casting, truly splendid results. Only men who will not see or who prefer the old way, just because it is old, fail to see in this progressive method that which gives to casting its most desirable feature. The molar crown can be just as easily manipulated as a bicuspid. In the process of adjustment it may become necessary, in articulating a bicuspid, to place a warm little ball of beeswax for a cushion while obtaining adjustment. This ball need not be taken out, but finished right over with the inlay wax. The beeswax cushion, remaining soft a long time, facilitates articulation, which otherwise would be difficult of accomplishment.

Should it become necessary to cast the base separately and then take an impression and run models, an accurate pattern for base and crown can be easily formed in a short time, and the two patterns can be cast in the same mold. The two castings may then be waxed in place upon the articulation and soldered together. Care must be taken to make the root base pattern very thin. There is to be noted here a very important point in favor of the mesh. A hot spatula may be run over, taking off the wax or shaping right down to the mesh itself, and the impression on the under side will remain unharmed. This pattern is left very thin so that there will



be room for adjusting the tooth coping to the root base coping when they are set upon the articulator for articulation. It is assumed that a tooth will be selected and approximately fitted before attempting to form any pattern.

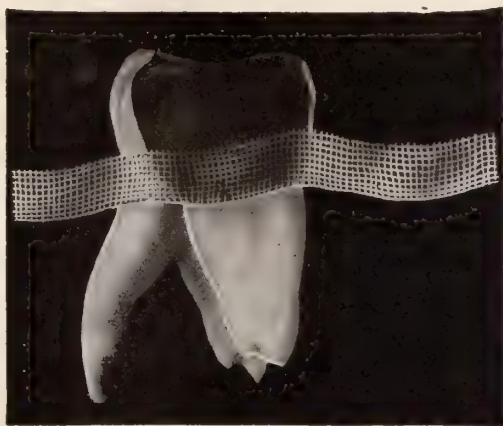
Much might be said concerning the modifications of these two types, but believe that the anterior all-porcelain type for anterior and the saddle shape all-porcelain type for bridge abutments are the most generally used, being aesthetic and economical. The selection of teeth for bridge abutments and dummies for bridgework would be seriously hampered for casting without a proper facing type of tooth suited to wax pattern work. The usual type of fixed pin facing tooth is not very satisfactory for casting. The new Dimelow facing presents a form of facing that is best suited to wax pattern work. The staple pins draw with the wax mesh pattern, giving a replaceable facing. The staple pins enter into the holes of porcelain facing at an angle, giving strength and permitting the tipping of the cutting edge of the facing. This facing has a distinct advantage in short bite and forming of wax mesh dummies.

It will be readily seen that the reinforcing principle may be applied to any form of root of any size, in any position, anterior or posterior—without having always to change technique or to encounter other difficulties.



## ALLOYED EDGES

It is quite well established that pure gold, properly treated, casts best. For a thin margin or band, the one objection to pure gold is that, being soft, it lacks the proper tenacity for polishing and burnishing to advantage. The mesh is 22k, and when the pure gold is cast into it the edges or margins become an alloy, giving the pure gold just the required quality for



this part of the casting. Thus, one may cast with pure gold and while in the mould form an alloy where it is most needed.

## CERVICAL TWO-THIRDS

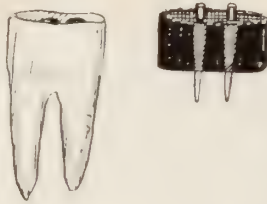
There are very few operators who are not willing to admit that the approximal space at this point offers some difficulties and inaccuracies in forming the wax pattern. The application of reinforcing the wax pattern at this point is so simple and effective that only a brief description of the technique is required. Manipulate between teeth as you would a piece of



silk tape; enter the mesh into the pattern with warm, thin spatula; remove, trim surplus mesh, leaving margin; over this flow a little wax; return to cavity and burnish margin with warm spatula. By this principle you are always certain that the cervical two-thirds is correct.

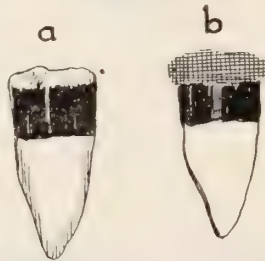
Just a word in regard to compound inlays or shallow wax inlay patterns. These patterns often become distorted in drawing, and is not noticed until too late. Many times the adding of wax to an edge or margin

of these types of inlays is quite difficult. When the general reinforcement or framework of mesh is employed, these difficulties are obviated. Technique is similar to root base. Another feature of no minor importance is the "Mesh Bite Crown." A band is made and adjusted in the usual way. Attach a mesh cover at top of the band. Tack mesh with solder at two points. A slight amount of wax is placed in the mesh and a bite is taken. Easy and accurate adjustment is quickly made, requiring



no carving inside and taking a minimum amount of gold for occlusion. The crown is cast. The outer edges of the mesh prevent the edges of the occlusion from shrinking in over the band. Union is perfect.

In the case of the gold crown, where the bite is very short and the crown part of tooth is gone, generally requiring a solid construction, and where a porcelain crown cannot be used—make band in usual way; cap with mesh. Insert pins through mesh into root channel. The bite is now taken and crown is ready for casting. This gives a strong attachment since the casting usually has at least two pins, and these may be tied to-



gether by placing a small amount of wax between the pins close up to the top on the under side. In the casting, gold takes the place of the wax and makes a very strong connection of the pins to the crown.

#### CONTROL OF SHRINKAGE AND WARPAGE

How, it is often asked, can the mesh exert any restraining power over the cooling metal? Let the most conservative but impartial operator make a reasonable number of tests, casting both with and without the mesh, taking the same care that he does in his ordinary practice in casting, and he will find results more uniform with mesh than without. Without mesh, under ideal conditions, with a perfect technique, and the expenditure of much time, observing carefully all the details of casting, one can obtain good results. Now, the majority of busy practitioners who are doing

casting, appreciate some of the difficulties, especially in root base work, when they get down to every-day practice and have an open mind and a welcome for a simple and scientific principle that lightens, expedites, and assures good results.

Here is the result of a test made:

A wax pattern with several thicknesses of mesh, also one without mesh, were cast at the same time, under the same and very favorable conditions, and submitted for analysis to an expert. It was found that the specific gravity of the casting containing the mesh was considerably less than that without mesh, indicating that the interstices contained air, and which would have a tendency to throw the contraction from the surface which the mesh immediately underlies. Another theory is that the casting cools quickest around the mesh, inasmuch as tests have proven that the mesh does not melt upon being surrounded by the molten gold, and which would have a tendency to minimize the contraction in the surface which the mesh immediately underlies—the adaptation surface.

Exhaustive tests have also proven that the mesh does not hamper the casting. Care, however, should be taken to bring the gold to liquid state. Use equivalent to ten pounds' pressure.

## TUBERCULOSIS AND ITS RELATION TO DENTISTRY\*

By L. W. Howe, M. D., Coldwater, Mich.

THE RELATION of an infectious disease to dentistry; one which causes such grave disorders in an individual as does tuberculosis bears much that is of utmost importance to both physicians and dentists. Often, indeed, do the teeth of a tubercular patient require attention, and the dentist should be ever on the alert, when caring for such a person, to detect the patient who has tuberculosis and to put into practice those measures necessary for the protection of himself as well as those patients that come to him for attention later. The dentist who has not a keen sense of observation may work on a patient having tuberculosis and not be aware of the fact that he is dealing with such a patient. The individual comes to the dentist to secure attention for his teeth, and detailed questions regarding his general health are not frequently necessary; while the same patient comes to a physician for the relief of certain symptoms, the treatment of which is possible only after a comprehensive diagnosis, reached by a careful study and questioning of the individual under consideration. Hence it is that while the physician recognizes the case of tuberculosis, the dentist is oftentimes unaware that his patient is affected with incipient or possibly farther advanced disease due to infection with the bacillus tuberculosis. When we think of the fact that from 70 to 90 per cent of the human race, as shown at autopsy, either die of tuberculosis or at some time

\*Read before the Southwestern Michigan Dental Society.



during their life have been infected by the bacillus; we can then realize how frequently we have to deal with such a patient. How often we see a patient come to the office, for example, let us say, a woman between 20 and 30 years of age, looking tired as though she had not much object in life; she moves slowly; as one physician said, "she has diminished dynamic activity." Her complexion is pale or of a sallow tint. There are numerous such women; and possibly she has not tuberculosis; but eight times out of ten she has, or has had. The symptoms of incipient tuberculosis are not well marked; a tired sensation, the patient arises tired out in the morning, or at least not as rested as she should be; there is possibly a loss in weight, and a loss in strength as well, as a result of which she becomes fatigued easily. There may or may not be a cough; but if there is it is usually more marked upon arising in the morning. Frequently this and a loss of appetite is all we see in the early stages. Later, of course, the symptoms are more marked and approach more nearly the classical picture of advanced tuberculosis.

It is not the object of this paper to give in detail the symptomatology of tuberculosis; but rather the bearing which the disease has upon dentistry. Hence, the various complaints and signs which these patients present will not be considered further except the unstable nervous organization, which is to a greater or less extent characteristic of practically all cases of the disease, particularly the pulmonary form. This is to a certain extent responsible for the fear and nervousness exhibited by these patients when they get into a dentist's chair, and it is because of this that the dentist is obliged to display a certain amount of patience and persuasion when working on them, doing either extractions, fillings, or other work that may be necessary. Here, also, might be mentioned the danger of giving ether as an anesthetic to a patient with tuberculosis. The increased bronchial secretion caused by ether and the danger of aspiration pneumonia are to be avoided, if possible, in these cases.

Tuberculosis of the mouth itself is rare, whereas tubercular infection in the tonsils, adenoids and lymph glands is exceedingly often encountered. Tuberculosis of the nasal cavity and of the accessory sinuses of the head is likewise comparatively rare. Tuberculosis of the mouth usually exists as a tubercular ulceration, or as tuberculosis of the mandible or maxilla, which in the latter case frequently involves the maxillary antrum as well. When it occurs in the mouth, it is usually associated with ulceration and infiltration and is readily recognized and differentiated from all conditions except syphilis. If syphilis occurs in such form that the dentist is liable to infection, it is usually recognizable by the primary sore or by mucous patches or by visible and easily recognizable tertiary changes. On the other hand, he is not as easily able to recognize the possibility of becoming infected with tuberculosis, for such may occur without visible lesions, and in fact without any lesion in the mouth whatever.

Tuberculosis of the nasal cavity is usually characterized by the same changes as we see in the mouth, and is frequently accompanied by marked destruction of tissue.

In the lymph glands and lymphoid tissue of the pharynx we frequently see some form of tuberculosis. The tonsils and adenoids are favorite sites for the development of the disease and are the portals of entry of the bacillus in a large number of cases. It frequently finds entrance to the lymphatic system here and travels the body, producing tubercular disease elsewhere therein. With a focus of disease in the tonsil we often find an adenitis, or enlarged lymph glands, a tubercular glandular disease in the cervical lymph glands. We, of course, may have a simple adenitis as a result of a "cold," a tonsilitis, or an infected tooth; but such is usually acute or subacute. Tubercular adenitis may be acute; but is frequently chronic in its course; and when we find enlarged lymph glands that are not very tender, and that have been present for several months or longer, we can be relatively certain that we have a tubercular infection in them. I shall not discuss the finer distinctions between simple and tubercular adenitis; but merely wish to impress upon you the necessity for recognizing a suspicious lymph gland or tonsil, for if such be present we frequently find tubercle bacilli in the mouth, even though we find no manifestations of the disease in the mouth itself.

Not all diseased tonsils are enlarged tonsils. Not all enlarged tonsils need removal. Some small tonsils do need removal. Removal of a tubercular tonsil, which has been associated with tubercular adenitis, will often cause an improvement in the adenitis. Tubercular tonsils are often small, contracted, pale or anemic, with deep crypts and ragged surfaces.

A large percentage of adenoids are tubercular, and while the characteristic face of a child with adenoids is well known, it is the presence of adenoids, and not the fact that they are tubercular, that produces the change in features. The same may be said of the cases of malocclusion that we find as the result of adenoid disease. But the important point for the dentist to grasp is the recognition of the fact that tonsils or adenoids may be and frequently are tubercular; that in these diseases and in incipient and farther advanced cases of pulmonary tuberculosis, and in cases of laryngeal tuberculosis we often find the bacillus in the mouth possibly lodged in a carious tooth or in the tartar upon the teeth, or between the teeth and along the gum margins; and he must realize that such cases demand of him the utmost care in regard to cleanliness and antiseptic precautions for the protection of the patient, the dentist, and other patients as well; that they demand of him a knowledge of the nervous instability which such patients possess, and also a knowledge of the fact that tuberculosis is frequently associated with marked and progressive caries of the teeth; while in no other condition is it more important that we have proper mastication and the resulting proper digestion. Patients suffering from tuberculosis are prone to have poor teeth. Their teeth rapidly become

carious; and it is not an uncommon occurrence to have a tubercular patient present himself with his teeth in poor condition, fillings having fallen out, new spots of caries having occurred, when possibly six or eight weeks beforehand he had had his teeth satisfactorily repaired. In the treatment of tuberculosis, one of the primary requisites for success is proper digestion and assimilation; and to attain such an end good teeth are absolutely essential. In view of the fact that the disease itself is characterized by poor teeth, at a time when proper mastication is all important, it is obvious that an added responsibility is placed upon the dentist when caring for a case of tuberculosis.

In all of my tubercular patients I emphasize the care of the teeth, regular cleansing with a brush and suitable paste or powder, a mouth wash, and proper toilet of the mouth in general.

The association of tuberculosis with marked dental caries is not surprising when we consider the following relationship: Dental caries occurs, to the greatest extent, during the third decade of life; that is, between the ages of 20 and 30. This is just the age at which we find the highest death rate from tuberculosis. Another fact similar to the above, is the association of dental caries and tuberculosis by the occurrence of pregnancy. If a woman suffering from tuberculosis, either active or latent, becomes pregnant, she usually reaches the time for delivery without serious trouble, but soon afterwards is frequently subject to an exacerbation of the tubercular process, or an awakening of the latent disease. The difficulty which dentists have to preserve the teeth of a pregnant woman in good condition is well known; so that here again we have a common factor causing dental caries and an increased activity of the tubercular process.

Such is the association of the two, in general, while locally the spots of caries themselves, whether occurring during pregnancy or not, offer an excellent opportunity for the propagation of the tubercle bacillus as well as other bacteria; because for its proper growth and multiplication, bacterial life requires warmth and moisture. What more ideal culture ground could be found than the cavity in a diseased tooth? And the tubercle bacillus is no exception to the rules for growth as applied to bacterial life in general. Decayed teeth offer an excellent opportunity for the growth and propagation of bacteria, and as a neglected oral cavity is usually a hot-bed for the various micro-organisms, the precautions which a dentist must take are almost self evident. Not only must he be careful to avoid infection in himself with the tubercle bacillus, and to avoid transferring the contagium to other patients, but he must be aware of the fact that infection with any bacteria occurs much more easily in a patient suffering from tuberculosis than in one who does not harbor the bacillus.

Sorgo of Berlin found the skin and mucous membranes of tuberculous individuals much more sensitive to toxins or infections of any nature than are those of healthy persons. Hence the necessity for all antiseptic precautions in extractions, fillings, etc., in the tuberculous; for these patients are



far more prone to develop infection in the tooth with abscess formation, an ulcerated tooth, infection after extraction, or infected and ulcerated areas as a result of some small accidental abrasion.

So the dentist must exercise extraordinary care with these patients, for tubercle bacilli may be in a state of active multiplication in a carious tooth. From such a location, Whitacre says they may enter the general blood or lymphatic systems, particularly the latter, giving rise to a tubercular adenitis. From the teeth they may also be directly inoculated into some other individual by a bite, a tubercular lesion developing at the site of the bite. Such cases have been occasionally reported, and about one year ago such a case came under my observation. A young girl was scuffling with a girl friend of hers and accidentally her friend's teeth caused an abrasion on the back of the other girl's hand. It was slow in healing and shortly after took on the aspect of local tuberculosis of the skin.

This suggests the occurrence of lupus, or tuberculosis of the skin, not necessarily due to direct infection. Lupus is frequently encountered by dentists. The favorite sites for its development are the temporal regions and the nose. It may begin acutely, but usually runs a chronic course, causing little disturbance, and persisting for years. Frequently, however, it will disappear completely for several months or possibly several years, only to return again, unless vigorous anti-tubercular treatment has been instituted. In the temporal regions a lesion of lupus usually appears as a circumscribed scaly area, resembling a dry form of eczema, while on the nose the lesion is usually covered by crusts. The contagium producing lupus is usually of a low virulency, yet, given the proper requirements for active growth, it may produce a virulent and active lesion of tuberculosis if inoculated on appropriate soil. Dentists, as well as physicians, therefore, should use every precaution against carrying tubercle bacilli from such a lesion or from the mouth or teeth to other patients.

Many dentists, as do many physicians, wear the deplorable hirsute adornment known as whiskers, beard, or mustache. A mustache, perhaps, is not as obnoxious as the beard; but only from a quantitative standpoint. The dentist is working directly in front of the patient's mouth, and any forcible expiration, sneezing, coughing, etc., carries with it a myriad of bacteria, which find a convenient lodging place in the facial hair as well as in that on the scalp. Social customs forbid us making ourselves as sanitary as Nature has made some of us by producing baldness; but they do not forbid our dispensing with the objectionable beard and mustache. If we will wear them, let us carefully anoint our heads, that is, the hairy portions, with some good disinfectant as a 5 per cent solution of phenol after having worked over a patient, particularly if such patient has accidentally coughed. The dentist should likewise use a good mouth wash as Dobell's solution or the liquor antisepticus. Borol is also a very good mouth and throat wash. The finger nails of the dentist, as well as his hands, should also receive careful attention. If you will scrub your hands carefully with

a brush, green soap, and sterile water, and then inoculate a culture tube with the material found under the nails, you will probably be surprised at the bacterial growth which occurs after incubation of the tube. I supposed I had my own hands sterile one day just before performing a minor surgical operation, but was decidedly surprised at the results of a culture taken from under the nails, and the nails were short, too. I supposed the day was past when it was necessary to caution a dentist about washing, just *merely* washing, his hands between work on two different patients; but found out the other day that it was not.

The sterilization of dental burs, chisels, and other instruments which are used in a patient's mouth, is best accomplished by boiling. The use of such solutions as hydrogen dioxide or alcohol to accomplish such an end is far from sufficient.

Alcohol as ordinarily purchased—96 per cent—has very little disinfectant property. In 70 per cent strength it has more; but even then is efficient only when allowed to act for 25 or 30 minutes. Many other antiseptic solutions are also objectionable in that they must be thoroughly rinsed off afterwards; so the agent par excellence for sterilization of instruments is heat, either dry heat or preferably boiling water.

We have said that bacteria occur, sometimes in great numbers, in carious teeth; yet I have often seen the dentist dry the cavity in a tooth with a cotton pledget and then shake the cotton from the forceps to the floor; in fact, it is a custom with some dentists to do so. A tubercle bacillus might have been in that tooth, it stuck to the cotton and then fell to the floor. Then the woman, when she cleaned the office next day, swept it up, and when the dust settled it found itself on the dental mirror, instruments, or on the towels, or possibly in the drinking cup. So let us use sanitary paper towels, which can be thrown away after using; let us use sanitary waxed paper drinking cups, one for each individual; let us sterilize our instruments and hands carefully; take proper precautions in regard to hair, mustache, and beard; burn our cotton pledgets or drop them in a receptacle containing a 5 per cent solution of phenol; and all of these precautionary measures will tend to protect dentist and patient alike from accidental infection with our common pus germs as well as with the bacillus that causes tuberculosis.

If we will realize, furthermore, that a patient with tuberculosis has a neurotic temperament, and is particularly subject to dental caries, and if the dentists will learn to look upon each suspicious case as one of tuberculosis, we will have made a certain advance. For, old as the adage is that "an ounce of prevention is worth a pound of cure," it is just as true here, and if applied to dentistry it will aid materially in the fight against tuberculosis.

#### DISCUSSION

DR. W. A. COOKE, Coldwater, Mich.: I think you will all agree with me that it is very seldom that we hear as interesting a paper as Dr. Howe has given us. Dr. Howe is not a dentist. He is a physician, whose specialty is tuberculosis, and it is very seldom

that we have specialists in the medical profession who are willing to associate the two branches as Dr. Howe has done. He recognizes our position in regard to public health, and he has given us some ideas that I am sure each one of us can prosper by, especially along the lines of being careful about the patients that we work upon and the precautions that should be exercised.

We all realize the danger of infection from syphilis, and every one of us sits up and takes notice if we are sure that a syphilitic patient is coming into the office, but here we have a disease—tuberculosis—with practically a bigger per cent than ten to one, who come in and we are all absolutely sure that we would not want tuberculosis any more than we would want syphilis. Dr. Howe has told us that from 70 to 80 per cent of the autopsies reveal cases of tuberculosis, whether they have died from that or whether during their existence some time they have had it. Probably not one-tenth of that number would be afflicted with syphilis. That shows to us that we should be just that many more times precautions in a case of tuberculosis as we would in a case of syphilis.

Dr. Howe mentioned the fact that he thought the time had gone by when it would be necessary to mention to dentists that it would be a good thing to wash even the hands before working on one patient after he had worked on another. A few days ago I heard of a case of that sort, and I heard of something along the same connection that was a good deal worse. A certain man went into a dental office for an extraction. He sat down in the chair, the dentist looked in his mouth and found a tooth that should be extracted, reached over into a box of instruments that he had, brought them out and started to put them into that man's mouth. The man said, "No, I guess not." He looked at them, and they were still covered with blood from the previous extractions. The dentist had never even washed the instruments. I think, gentlemen, there could not be a better talking point along the lines of consolidation, for the State Society, than some such things as that, and then watch out in the society and not let such dentists as that get into the society. I think it is the finest chance to—well, not actually disbar, but along the same lines. I would just simply "oust" a man who exhibited such carelessness as was shown in this case. I am sure we are all very grateful to have Dr. Howe here, and Southwestern Michigan, I believe, will thank Dr. Howe very gratefully for coming here and giving us his time and knowledge.

There is one more thing I would like to say here, and that is for the secretary of the society. Very few, I am sure, will realize the work that it takes to hold a successful meeting, and Dr. Patterson has been exceedingly diligent in his efforts to make this a success, and I am sure, from the program, that we will all agree that he has been successful.

DR. C. B. BLACKMARR: I came here especially to listen to Dr. Howe's paper. My wife, when she read that Dr. Howe's subject was tuberculosis, got a real early breakfast for me so I could come over here before Dr. Fowler or any of the rest of the boys, I believe, were up. Evidently Dr. Howe has been having some dental work done, and of course, by Paterson or Cooke. He would not have known about some of those things that ordinary dentists do unless he had had some of that work done. I enjoyed hearing the paper very much indeed. I believe I want to disagree with him in one respect. He said that there was not so very much tuberculosis of the mouth—at least it was very rare. I believe as time goes along we will find that there is more tuberculosis of the mouth than we imagine. I think there are a good many cases of pyorrhea trouble, that if we investigated thoroughly we would find was tubercular trouble.

I notice he said we should try at least to detect tuberculosis in our patients. That is not an easy thing for the dentist to do, when I know that my wife, who became infected with tuberculosis ten years ago and was under the care of one of the finest physicians in Jackson, who was president of the Anti-Tuberculosis Society, and he never detected it at all. Dr. Vaughan of Ann Arbor did detect it. So that with the ordinary dentist, I am afraid he would not be very likely to detect it. I was very glad to hear Dr. Howe say what he did about diseased tonsils and adenoids, and that so many times



it depends upon the condition of the tonsils and the adenoids, whether they need removing or treating. And you will remember that he said that not all enlarged tonsils should be removed. Many times a dentist looking in the mouth sees an enlarged tonsil and thinks, of course, that it needs to be removed. I am sorry to say that there are a whole lot of tonsils that should be removed that are not. In regard to germs, of course there is a whole lot of nonsense said about them. The physicians advise us dentists not to kiss our patients on account of germs, and yet I don't think that there is a class of men in the world that kiss as many patients as the physicians do. Dr. Cooke advised keeping out of our societies some dentists who keep blood and debris on their forceps, etc. I don't care how bad we are or how good we are, it is not always the members of the State Society that do that which is not wrong. I think the way to educate dentists is to get them into the society. Mention was made in regard to the fact that a metal arch on the outside would not expand the arch so as to affect the nasal opening. Dr. Brown of Milwaukee, in treating catarrhal conditions today, puts arches, jack screws, etc., upon adults and opens the suture between the maxillary bones for the purpose of making the opening there effect the breathing space. I have made a study of these things somewhat in an orthodontal way, and I am glad to say that one of the most skeptical men (a rhinologist) that I had in Jackson, in regard to what could be done to the nasal opening by enlarging the arch of the teeth, has come to me and told me he was perfectly surprised at the better way his patients could breathe, so much better after I had expanded the arch. There is no question about that at all, and so many times these patients will have diseased tonsils that should be certainly treated in the same way, either removed, or something done. I have one patient who had tuberculosis and was sent by a specialist, and during the time that I was treating her I was constantly urging the parents to have her diseased tonsils and adenoids removed, and they did not think it necessary, but at last I convinced them of it. She had been sent to Colorado and she was sent to Minnesota for two seasons on account of her tubercular trouble. When she came back I looked at her and said I was certain they should have the tonsils removed. She was taken to Ann Arbor and had them removed, and they were examined microscopically and found to contain tubercular deposits, so much so that one physician who examined her sputum found it to be absolutely free from tubercular germs in a very short time after the operation. The girl is entirely well without going to Colorado or the Western States, and so many times those diseased tonsils are so filled with tubercular germs that the patient certainly becomes infected generally, and I think we as dentists, after listening to such a nice essay as we have on that subject, should pay more attention, especially as I would think, to the looking to see whether the tonsils are diseased or not. I thank you.

DR. A. C. RUNYAN, South Haven: I am very much interested in the paper and in the fact that the physicians are coming to us and are willing to give their time and efforts with us. I think that there ought to be a more brotherly feeling between dentists and physicians than there has been. Of course, in a way we are to blame for that. We have not educated ourselves up to the point where we could affiliate. However, what we have done, in a great many ways we have led the physicians. We are a body of men who are constituted differently. Our field covers a wide scope, in a way; we are mechanical, and being mechanical, we come in contact with and recognize conditions that a great many times are not recognized by the physicians. I think that if physicians would meet with us more frequently we would be less liable to be misunderstood and would escape such criticism as given by Dr. Hunter, the great English surgeon. If Dr. Hunter would stop to think just once he would realize that one abscessed root in the mouth or one carious tooth was causing more harm than any improper bridges that could be put into the mouth. We ought to feel sorry for a man who will display his ignorance of such dental operations. We have probably all read more or less through our journals and the medical journals what a tirade he has made against American dentists and the American manner of taking care of the teeth, and if physicians would

meet with us more often I think that they would have quite a different idea of what the dentists are doing. You will remember that it was the dentists that developed anesthesia; it was the dentists that first called the attention of the physicians to the need of the removal of adenoids and enlarged tonsils, not only for reasons of facial deformities they caused but for their effect on the general health.

A few years ago I attended the National Convention in Milwaukee and there were those there who said it was impossible to change the condition of the nasal passage by widening the dental arch. Those conditions and their effects have been brought to the attention of the medical profession almost wholly through the efforts of the dental profession, and I believe there ought to be a way of having a dental branch in their medical meetings and a medical branch in our dental meetings so that we can come more closely together and work in harmony for the general health of mankind. I am very much pleased that in the Southwestern Society we frequently have had physicians come in and take part in our meetings. I do not know that I have ever known it to occur in any other dental societies that I have ever attended, and I am very much pleased to listen to such a paper as read by Dr. Howe, and we are glad that they recognize that the dentists are doing a part toward the real relief of the human race and are doing a large part.

DR. E. H. COLLIER, Battle Creek: I have given the subject no particular thought. One thing occurred to me, and that is, that as time goes by slowly, ideas are accumulating rapidly, and we have a great idea coming through the country today in regard to there being causes for conditions, causes for effects, and remedying causes to remedy the effect. We have a tubercular patient. There have been causes leading to that tubercular condition. The most important of those causes are improper breathing, improper mastication, and improper use of food, consequently improper assimilation. I was somewhat disappointed in not hearing the doctor say something in regard to the causing or requiring proper methods of breathing, proper methods of choice of food, and things along that line. The tubercular patient has in a majority of cases, I believe, come about by improper breathing. An improper breather causes conditions of the oral cavity that bring about effects, and I am getting to believe a great deal with some of these newer and, I believe, broader thinkers, that a great percentage of those conditions can be remedied without interference of operative surgery or medical application. It is impossible to conceive of the application of a remedy expanding the chest of the consumptive patient, and unless that consumptive patient, in connection with his medicine, makes use of proper breathing, proper manipulation of all the organs of the body, you cannot expect much.

DR. HOWE, closing discussion: In regard to the question of widening the arch, causing better breathing in many of these cases, I would say that the work done on that line certainly is very satisfactory indeed, and the proper breathing in these cases is essential to an ultimate cure, as is proper food, rest, and so forth. Widening the arch certainly helps the nasal cavity and frequently overcomes defective breathing, sometimes caused by an obstruction in the turbinate or spur, so that it is necessary.

Speaking about the deformity, they get the same tubercular chests. Of course, it is a question whether the deformity of the chest causes tuberculosis, or tuberculosis causes deformity of the chest, but some experiments have just recently been carried out in binding the first rib tightly, so that there is no expansion of that portion of the chest, and we have found that the disease will almost invariably be confined in the apex, showing that defective muscular action of that portion of the chest certainly predisposes, at any rate, to the development of tuberculosis.

Speaking about the frequency of tuberculosis, I made the statement that it was rare relatively in the mouth, in regard to tuberculosis in other portions of the body, and when in regard to cases run across in the clinics and compared to what we find in other parts of the body, pulmonary and intestinal tuberculosis, it is rare, although I think there are many cases of tuberculosis of the mouth that are not recognized as such.

We have to go to the dentist oftentimes for other diseases, as well as the one in question. Very frequently the presence of diabetes in a patient is brought to the physician's notice by the condition the dentist finds in taking care of the patient's teeth, and in the same way with syphilis. He may be treating a case for some obscure condition, symptomatically, and possibly cannot get benefit. The first thing we know, the dentist has that same patient under his care and tells the physician, "Here is a case of Hutchinson's disease. We frequently give anti-syphilitic treatment as we used to give mercury and iodide, and you get relief. As far as the dentist being able to diagnose and detect tuberculosis, it is a hard matter. It is a hard matter for the physician to say "You have tuberculosis" by simply looking at the patients as they come into the office, but if we will treat these suspicious cases as such, we better err on that side than to err on the other side; and personally, if a case comes to me with a cough, and a cold, if they have not gotten over it as they should and it has hung on for three or four weeks, if I find a patient losing a little weight, I immediately look for tuberculosis and, in many cases, find it, and if I do not find it after repeated examinations I usually give some form of tuberculin test. The doctor spoke about his own wife having it. My wife is in the same position. I am sorry to say that I did not recognize it sooner than I did. While the dentists think that they need the physician, the medical profession is just as equally positive that they cannot get along without the dentist. I thank you.

## ALVEOLITIS—ITS SURGICAL AND "PROPHYLACTIC TREATMENT"\*

By M. H. Fletcher, D.D.S., M.D., M.S., Cincinnati, Ohio

**I**N RESPONDING to your courteous request to address you on Prophylaxis in its broader sense, I have remembered that "Oral Hygiene," "Oral Sepsis," "Pyorrhea Alveolaris" and "Prophylactic Treatment" are all terms much on the tongue of the dental profession of today.

These terms all point to a condition or disease to be avoided. Pyorrhea Alveolaris means a flow of pus from the alveolar process, which means that a septic poisoning of that bone has occurred. This presupposes that a lesion of some type must have occurred to permit of septic entrance.

"Oral Hygiene" means science of health and mouth, to prevent diseases of other tissues as well as the avoidance of decay of the teeth.

"Prophylactic" means tending to ward off disease, preventive treatment (I wish the word Preventive could have been adopted with us in place of Prophylactic, it is much plainer English and for this reason is used by medical men).

"Oral Sepsis" means poisoning of the mouth, or poisoning of the body from the mouth, by putrefactive germs or their toxins.

Surgery is that branch of medicine which treats disease, wholly or in part, by manual and operative procedures.

This disease, or these diseases, or these conditions and their results, which are the object of the foregoing surgical and preventive procedures, from my viewpoint, need to be better classified and described, so that they can be more easily understood and hence more intelligently treated. For instance, I know of no work on surgery which describes these conditions

\*Read before the Odontological Society of Western Pennsylvania.



and their treatment as the same work describes much less important and less dangerous diseases. This is no doubt due to the fact that up to the present no classification and description of the disease has coincided with the accepted ideas of pathology and treatment.

Robert Hutchison, in *The International Medical Annual*, says: "Accounts of the morbid anatomy and pathology of pyorrhea are still very confused and, strictly speaking, the condition so-termed is only one phase of what may be comprehensively spoken of as 'oral sepsis.'"

Now, gentlemen, it is up to us, as mouth specialists, to so comprehend and describe this disease in all of its phases that such a thing cannot be said of us.

What follows is one more of the numerous attempts to describe the disease, taking it through its etiology, pathology, evil results, and why it needs preventive treatment. It is to be understood that properly practiced Oral Hygiene tends to prevent decay of the teeth as well as disease of the gums and sockets of the teeth.

#### ALVEOLITIS

In order that the different stages of the disease may be defined and described, as is done in other surgical diseases, the term Alveolitis will be used in place of Pyorrhea Alveolaris. Alveolus, indicating the locality of the disease, and "itis" meaning, inflammation; that is, inflammation of the alveolar process.

Alveolitis is a disease of the bone which supports the teeth and involves the overlying gum tissue, also the periosteum and peridental membrane. It results in the ultimate loss of the teeth by the destruction of the alveolar process. After the onset in the gums, and the alveolar process has become involved, the malady is primarily that of the bone, that of the gums being secondary. This is evidenced by the fact that the gum tissues remain intact and nearly to their normal height long after deep pockets have been formed in the bone, and that the gums promptly recover their normal health when the bone loses its disease. Again, no amount of gum treatment, pure and simple, will cure the disease. In view of the above statement the following nomenclature has been adopted:

The disease may be described in all its phases by arbitrarily dividing it into stages, as follows:

Initial or Simple Alveolitis.....	Chronic Non-Suppurative Alveolitis
Non-Suppurative Alveolitis.....	Chronic Suppurative Alveolitis
Suppurative Alveolitis	Descriptive Subdivisions { Necrotic Non-Suppurative Alveolitis, which is always chronic. Necrotic Suppurative Alveolitis, nearly always chronic, but may be acute.
Necrotic Alveolitis	
Acute Alveolitis	

The subdivisions are merely descriptive of combined conditions.

All the pathologic features may be found, in some proportion, in each stage excepting the beginning of the initial stage. But the feature pre-

dominating determines the name of the stage. However, no stage is definitely marked from the other; this is also true of practically all diseases. Inflammation, accompanied by elevation of temperature, either local or systemic, is always present to some degree with this as with every lesion of the body. Hence the termination "itis" as in Osteitis, Pleuritis, Nephritis, Alveolitis, etc.

Initial Alveolitis means the beginning of the disease in the gum-margin at the necks of the teeth. It usually starts from local irritants such as tartar, splinters, wedges, clamps, ligatures, rough edges of fillings, etc. These irritants cause wounds in the gum tissues, which wounds are the doors of entrance (the infection atrium) of the infectious bacteria. These infections may perpetuate the disease long after the irritants have been removed. All the irritants mentioned, excepting tartar, simply create the wound, which wound may be perpetuated by microbes. Tartar, however, is a continued and progressive irritant, and perpetuates the disease, in most instances, without the aid of infective bacteria.

Tartar is a normal constituent of saliva and deposits in the protected places against the gums about the necks of the teeth, especially between the teeth. If undisturbed, it in due time becomes almost as hard as the tooth, and very adherent; it is also rough and irritating to the gums, acting in the same manner as a splinter in the flesh.

The pressure of tartar against the gums, be it soft or hard, will in time induce destruction of the mucous membrane, creating an open wound, which bleeds on removal of the deposit. This fact is demonstrated by the bleeding observed on the removal of cotton or gutta percha which has been pressing against the gums for a few days. These wounds, be they ever so small, are the beginning of the disease; that is the initial stage. This condition may continue slowly progressive for years without apparent infection. It is the most prevalent form of the disease and is designated as Chronic Non-Suppurative Alveolitis, or Simple Alveolitis, and is present to some degree in almost every human mouth and in some domestic animals.

#### CHRONIC NON-SUPPURATIVE ALVEOLITIS

The ever-present effort of Nature to ward off disease may for years prevent a malignant infection of these wounds. With some persons it may be for a life time, but the ultimate end of the disease is the loss of the tooth if the patient lives long enough and the deposits be not removed. This process is as follows:

Where tartar presses against the gums an open wound occurs and inflammation and swelling of the gum tissue follows. This inflammation is indicative of Nature's effort to dispose of a foreign body, as is shown in the inflammation and pus about a thorn or splinter, the process being exactly the same. Tartar cannot be thus disposed of, however, because it is fastened to the tooth. The inflammation and swelling of the gums cause them to stand away from the tooth, which allows the saliva, freighted with calcareous material, to invade these spaces. Thus the deposit of tartar

goes deeper and deeper, because the flesh recedes in order to get away from the irritant. This intended process of healing, on the part of Nature, results in the resorption of the alveolar process in the same manner that a gut ligature or sequestrum is resorbed, thus the pockets become deeper and deeper until the bony support is entirely destroyed and the tooth is thrown off.

This Simple or Chronic Non-Suppurative form is so-called simply because the pus is not visible, and, as stated, is the most common of all forms of the disease. In some stage of progress this form is found in practically all mouths of adults and sometimes in children; it may exist for a lifetime with little or no inconvenience to its host. Nevertheless, just before the tooth is thrown off suppuration and soreness may appear about the apex of the tooth. This infection may occur at any time after the initial lesion is started. When a malignant type of infection finds encouraging environment in one of these chronic non-suppurative wounds, it is most apt to be suppurative in type (staphylococcal and streptococcal). This is much more rapid in its destructive progress than the non-suppurative form. When suppuration exists in one place it is apt to be found in several places and many times in all the sockets, constituting Suppurative Alveolitis or so-called Pyorrhea Alveolaris.

#### SUPPURATIVE ALVEOLITIS OR PYORRHEA ALVEOLARIS

When we have pus exuding from the sockets, it may be in such quantities that it is easily seen, or it may be easily pressed out with the fingers. On the other hand, it may be in such small quantities that it can only be seen with the aid of the microscope and is then called non-suppurative, as described above. .

The suppurative malignant stage once reached, however, the alveolar process and cancellous bone are destroyed much more rapidly than in the previous stage.

Once getting a start, the suppurative type may progress without the necessary presence of either tartar or serunal calculus on the roots. Or the initial injury may have been from bands, rough fillings, etc., as mentioned. A great many teeth are lost from this suppurative type of the disease and in consequence the name Pyorrhea Alveolaris was given it, but this name only indicates this particular stage, the other phases at that time not being recognized.

There being no deposits on the roots of some of these teeth has led many to say that calcareous deposits or other local irritants have little or nothing to do with the disease, claiming that it is systemic in its origin, an accompaniment of the uric acid diathesis, or from arteriosclerosis and its accompaniments. However, if the complete history of the disease could be known, I believe without doubt it would be found that the disease always starts with a local irritant and lesion, and is perpetuated by the continued presence of calculus or by a local irritant and infection, as above described. Those claiming that the disease is caused by other than local irritants all



admit that local irritants must be thoroughly removed and the pockets sterilized before the disease will disappear. The tartar or other irritants at the necks, which caused the initial lesion, may still be present or may have been removed. If tartar, it may have been brushed or worn away, leaving the teeth free from deposits but still suppurative, thus the initial irritant may not have been observed. It must be remembered, however, that there can be no lesion without a cause, and there can be no infection without a lesion. Tartar is evidently one of the greatest causes of these lesions and pus germs almost the universal infection.

The most frequent result of this, the suppurative infection, is destruction of considerable zones of bone. This is especially true in the cancellous septi, between the teeth, or the more open bone deeper in the alveolar process and maxillae. This condition is often comparable to osteomyelitis or tubercular bone and results in the death and destruction of much bone about and beyond the sockets of the teeth, and is known as Necrotic Alveolitis.

#### NECROTIC ALVEOLITIS

When the cancellous bone about or beyond the roots is reached, as above described, any germs capable of living in such environment not only find Nature less capable of resisting their progress, but they find greater protection and more favorable conditions for rapid multiplication. Consequently considerable zones of bone die. This necrotic bone now becomes an additional object of care by the elements of protection and repair. But because the deposits may still be adherent to the teeth, or the microbes are so plentiful that she cannot destroy them entirely, Nature cannot accomplish the object of repair without assistance. She never ceases her efforts, however, until she disposes of the tooth, irritant and all, then the army of repair can heal the wounds. In this stage of the disease calculus is often found about the apices, especially of the upper molars. Under these conditions the antrum is frequently penetrated, which often means empyema of this cavity, with all its accompaniments. This penetration of the antrum is most apt to be between the first and second molars, but it is often between the second and third. The bone about all the teeth in this locality is more or less involved.

Another troublesome locality is that of the cancellous bone anterior to the antrum, sometimes running underneath its forward portion. It is beneath the floor of the nose and surrounds the apices of the bicuspid teeth. This zone often becomes diseased or destroyed, leading some to think the antrum has been penetrated, and it may be but secondarily so. Keen diagnosis is often necessary in distinguishing between disease of this zone and that of the antrum. Even radiographs may be misleading in some of these cases. The treatment of these cases is that of diseased bone and not that of a diseased antrum. Alveolar abscess or carious conditions about the apices or in the sockets of the upper bicuspids are usually the causes of disease in this zone.

Deep-seated necrotic cases, in the lower jaw sometimes result in the necessity of removing quite a portion of either the outer or inner plate of the jaw and the loss of one or more teeth. In fact, the ravages of the diseases may not stop short of the necessity of removing considerable portions of the jaw-bone.

In some instances, both in the lower and upper jaw, quite large necrotic zones are found in the bone about, between, or beyond the teeth. These cavities are often not associated with pus formation, but are of a "dry" necrotic or carious character. They are usually not accessible without drilling or curetting into them. The symptoms leading to their existence are usually pain of a neuralgic or *tie-douloureux* character. The existence of these cavities is not commonly known, the pain usually being attributed to neuritis (neuralgia) or possibly *tie-douloureux*. The treatment given in these instances is usually systemic for neuritis, instead of surgical for diseased bone, consequently the patient often suffers for years without relief. Removal of the teeth involved usually gives entire relief, but healing may be induced by curetting or burring out the diseased bone and sterilizing the cavities, persisting in the treatment until recovery takes place. The *tie-douloureux* features would require a separate paper to describe them, hence they will not now be discussed.

#### ACUTE ALVEOLITIS

The word chronic, as applied to disease, means a long-continued pathologic condition not especially severe. Acute, as applied to disease, indicates a sharp and painful course, but relatively short and severe. For instance, a painful gingival abscess is acute suppurative alveolitis. Vital teeth, with non-suppurative necrotic bone about the roots, may become pyemic and suddenly become very sore and painful; this is also acute suppurative alveolitis. In fact, most cases of acute alveolitis are associated with pus formation, the only exceptions I know of being those of acute pericementitis, or gingivitis, starting from trauma or irritants about the gums. The adjectives acute and chronic should be used in this disease just as they are in others, viz., to describe a present condition.

Practically all cases of necrotic alveolitis are chronic, but they may receive a secondary infection and become acute and suppurative at any time.

The various stages of Suppurative and Necrotic Alveolitis are synonymous conditions with Chronic Suppurative Stomatitis, Putrid sore mouth, Ulcerative Stomatitis and Fetid sore mouth. They are so described by many authors on medical practice and by medical practitioners. We should be able to show them that these are simply stages of one disease, viz., Alveolitis.

#### DISEASES OF THE GUMS—GINGIVITIS

"Soft," "bleeding" or "spongy gums" and other diseased features of the soft tissues are necessarily an accompaniment of the diseased bone

and are a natural result of local irritants. The initial stage always precedes these conditions. The break in the gums allows infection to enter, and both tartar and infection increase as time goes on in spite of Nature's efforts to throw them off, as before described. This effort also results in the destruction of the periodontal membrane along with the bone. Local irritants and diseased bone are the underlying factors of "soft," "spongy" and "bleeding gums." When these causes are removed the gums promptly recover and retain their health under proper preventive treatment.

#### TREATMENT

The so-called "Prophylactic Treatment" of today is really the surgical treatment of the disease. In this treatment the doctor removes the exciting causes, which are the calcareous deposits and infection in the sockets. Really the person to do the prophylactic treatment is the patient himself. The doctor, having done the surgical part, should teach the patient how to do the preventive part. The latter is a matter of keeping the tongue and mouth clean by scrubbing and antiseptic washes and gargle and the teeth free from tartar or other irritants about their necks with brush, picks, floss, powder and antiseptics. The patient may have to return two or three times a year to have places cleaned which they cannot easily reach, but they can and do learn to do the preventive treatment properly.

It should be remembered that the periosteum and the periodontal membrane, as well as the gums covering diseased bone, partake of the disease of the bone, in this locality, the same as in bone disease in other parts of the body. Treatment, therefore, should be directed toward having the bone recover and become well. Then, only, can the gums be free from disease. No amount of treatment of the soft tissues will make them heal while the underlying bone is diseased.

The whole operative treatment then consists in removing *all* deposits from the roots and necks of the teeth, sterilizing these surfaces, removing the dead and diseased bone in and about the pockets, sterilizing the sockets and cavities of bone and keeping them thus until recovery is complete. This is practically the procedure in dealing with diseased bone in other parts of the body.

#### INSTRUMENTATION

As to instrumentation, it is assumed that each one is familiar with some set of instruments and a method of using them. The greatest short-coming, however, is the lack of thoroughness in reaching and removing deep-seated deposits near the apices of the roots, and dead bone beyond the apices. This requires a touch trained to distinguish between deposit and tooth and between live and dead bone. It also requires courage, skill and conscious effort on the part of the operator, coupled with a knowledge of the anatomy and pathology. Thus only can all the irritants be removed. This must be followed by suitable methods of sterilizing the wounds, for in but few cases is it practicable to remove all dead and diseased bone and



all infection, but if a sufficient amount be removed Nature will be able to throw a great enough army of repair about the wound to destroy the remaining bacteria and remove the dead bone, then she rebuilds all she can of the destroyed tissue. The plan of repair is ever the same in all tissues, and if the proper assistance be given Nature will always repair to her fullest capacity.

My own practice in sterilizing these pockets is to use pure tincture of iodine or pure lactic acid, especially in extended diseased zones. Lactic acid is indicated where pus is present. Many other remedies may be equally good, but each one must select his own, keeping in mind the object to be accomplished. A long hypodermic needle and cotton wound on a "twist broach" have, in my hands, permitted me to medicate any case yet presented. I have devised and had manufactured a set of curettes and engine burrs for removing dead and diseased bone. The burrs are usually more efficient and less painful. However, the "Plane-bit" type of cleaners are all-sufficient in most cases.

#### PROPHYLACTIC TREATMENT

The so-called "prophylactic treatment," as stated, is really the surgical treatment, since it is the removal of the exciting and secondary causes. This is true, whether it be comprehended and consciously done or whether it be done without a knowledge of the laws of pathology and repair. This surgical treatment is to the end that the army of repair in the tissues may have opportunity to reproduce what has become diseased or destroyed. As before stated, with these tissues once well, the gums naturally recover.

In the Initial and Non-suppurative stages of alveolitis, simply removing the tartar ("cleaning the teeth") enables Nature to heal the wounds. This is all the treatment a large majority of cases get in the hands of most dentists, and all they need. But it is most desirable to know the whole pathology and treatment of the extreme causes as well as the simple ones.

#### RECOVERY

As to recovery, it should be borne in mind regarding the deep-seated cases, that it takes the bone of the jaws and the cementum on the roots as long to repair as it does any other bone. The cementum takes longer than the bone, and it is the cementum upon which repair in these cases is most dependent. Repair requires from three to six months. In some cases a year or more may elapse before Nature can finally fight off the remaining infection, resorb the dead bone not removed and rebuild the new bone and cementum. In each case Nature is likely to need the doctor's assistance until recovery is complete. In numbers of instances it will be found impracticable to remove enough diseased tissue to induce recovery, but cases that sometimes appear "hopeless" will respond and render service for one or more years.

It should be continually borne in mind that no doctor "cures" anything. The brightest and best doctor is he who comprehends the cause of disease and removes it if possible, knowing that Nature will heal if the cause be removed, and will preserve health if the cause be prevented from returning, and alveolitis *will* return if preventive treatment is not continued.

#### SYSTEMIC TREATMENT

Alveolitis, like all other diseases, has its nervous phase, which feature may result in discomfort, pain, or total disability, according to the intensity of the disease. Alveolitis, like all functional or organic diseases, is encouraged by auto-intoxications and the numerous manifestations accompanying them, such as gout, uric-acid disorders, arteriosclerosis, etc. But I know of no systemic pathological conditions which could cause the almost universal presence of Alveolitis without manifesting itself locally elsewhere in the body. We all know that Alveolitis recovers without systemic treatment, but systemic treatment often materially assists in recovery. During systemic disorders any weakened organ or "point of least resistance," such as "sore gums," becomes easily inflamed and acute, the local features being intensified. If, therefore, systemic disorders are manifest and serious, they should have attention at the hands of the operator or the family physician. On the other hand, I believe Alveolitis is not only of local origin but, in its suppurative and necrotic stages, is a great predisposing factor in the cause of many bodily diseases, such as anemia, disorders of the alimentary tract, etc. This feature of the subject has recently been studied and written about by several physicians, among them are Drs. Hutchison, Turner, Hunter, Lang, and others. You may remember the garbled and misrepresenting quotations from William Hunter, M.D., in *Current Literature* of August, 1911. But the complete article is of great merit. I know of no one who has so forcibly put before us the value of Oral Hygiene and the dangers of "Oral Sepsis." I considered his last paper of such importance that I had reprints made of it and sent to several hundred of my dental and medical confreres. I recommend it highly for your study, and I believe I cannot do better, in closing, than to quote some paragraphs from the part on "Oral Sepsis," omitting the parts where he refers to what he calls "Septic Dentistry." This paper was published in the London *Lancet* of January 14, 1911, page 79. Its title is:

#### THE ROLE OF SEPSIS AND OF ANTISEPSIS IN MEDICINE

An Address Delivered at the Opening Session of the Faculty of McGill University, Montreal, October 3, 1910.

By William Hunter, M.D., Edin., F.C.R.P., London

Physician and Lecturer on Pathology to the Charing Cross Hospital, London;

Physician to the London Fever Hospital.

#### ORAL SEPSIS

"In the foregoing sketch of the chief spheres of the doctor's work and interest I omitted any reference to one other portion of the body which

constantly comes under the observation, indeed more often than any other—I mean the mouth. This omission was intentional on my part. The cases presently to be described—which could be multiplied by thousands and tens of thousands coming under the daily notice of doctors—illustrate how constant the omission is in practice.

“What I desire to impress upon you students, and all students entering the profession, and all those already engaged in the practice of the profession is, it is ‘not a matter of teeth and dentistry.’ It is an all-important matter of sepsis and antisepsis that concerns every branch of the medical profession and concerns very closely the public health of the community. It is not a simple matter of ‘neglect of the teeth’ by the patient, as is so commonly stated, but one of neglect of a great infection by the profession—a great infective disease for which the patient is not primarily responsible any more than he is responsible for the contraction of typhoid fever or tuberculosis. The condition referred to is that to which I have given the name of ‘oral sepsis.’” \* \* \* \*

I would take issue with Dr. Hunter in this statement, for the patient can prevent it to a very large degree, and it is up to the dental profession to show this fact by teaching every patient how to cleanse the mouth and how to keep it free from the septic conditions referred to, thereby largely warding off the following list of diseases as set forth by the essayist. Dr. Hunter says on this point:

“The chief feature of this particular oral sepsis is that the whole of it is swallowed or absorbed into the lymphatics and blood. Unlike the sepsis of open wounds on the outside of the body, none of it is got rid of by free discharge on the surface. The effects of it, therefore, fall in the *first place* upon the whole of the alimentary tract from the tonsils downward. These effects include every degree and variety of tonsillitis and pharyngitis; of gastric trouble, from functional dyspepsia up to gastritis and gastric ulcer, and every degree and variety of enteritis and colitis, and troubles in adjacent parts, like appendicitis. The effects fall, in the *second place*, upon the glands as (adenitis), on the blood as (septic anemia), puerperal fever as (septicemia), on the joints as (arthritis), on the kidneys as (nephritis), and on the nervous system. \* \* \* \*

“The title ‘Oral Sepsis’ was first introduced into medical literature in a paper entitled ‘Oral Sepsis as a Cause of Disease.’ My object in seeking for a special name, and after consideration in creating this one, was to emphasize the great fact that it is not the absence of teeth, but the presence of sepsis, that it is not dental effects, but septic effects; that it is not defective mastication, but the effective sepsis associated with conditions of gingivitis apart from dental defects that are responsible for the ill-health associated with ‘bad’ mouths. \* \* \* \*

“The subject of ‘Oral Sepsis,’ as I designated and defined it, namely, the septic lesions of streptococcal and staphylococcal infection found in the mouth, belong to no one department of medicine or surgery. It is common ground on which the general doctor, physician or surgeon; the throat, nose, and ear and eye specialist; specialists in children’s diseases, in stomach diseases, in blood diseases, in ‘rheumatic’ diseases, in fevers, in skin diseases, in nervous and mental disease, and lastly, the dental surgeon, all meet on terms of equal responsibility. In its earliest manifestations no special knowledge is required to deal with it; a sound grasp of the principles underlying antisepsis alone is required. Unfortunately for the patient, it is precisely this grasp, which I grieve to say, is wanting. \* \* \* \*



"For this is what the practitioners are constantly doing. Wherein consists the pathological difference between a follicular tonsilitis and a foul, septic, suppurating condition of the gums, with deposition of calcareous 'crusts and scabs' (so-called tartar) covering and hiding septic wounds and ulcers, loaded, as microscopic examination shows, with staphylococci and streptococci. None whatever, except that the latter is exceedingly common and the tonsilitis is comparatively rare. The pathological condition in both is the same, namely, sepsis. Moreover, it is sepsis, as easily recognized, and much of it as easily removed in the case of the one as in that of the other, and the more urgently requiring to be removed, since it is more important as a potential disease factor than any other source of sepsis in the body. \* \* \* \*

"This matter of oral sepsis is, therefore, of urgent importance in relation to the whole multifarious and widespread group of affections—medical, surgical and dental—caused by the actual presence of toxic action of pyogenic organisms (staphylococci and streptococci)". \* \* \* \*

"I submit, then, once more, as I did in the first communication (1900) bearing the title of 'Oral Sepsis,' that in the interests of the many sufferers from the great group of medical affections which it produces, this condition of oral sepsis, the chief channel of access of all pyogenic affections, is urgently deserving of increased notice and attention. Knowing, as we do, the pathogenic qualities of staphylococci and streptococci, we have not the slightest excuse for allowing the mouth, so easily accessible to local measures, to remain their chief seat, and its open wounds a veritable hot-bed for their development and propagation; on the contrary, it is a severe reflection on our profession if we allow it." \* \* \* \*

#### DISCUSSION

W. L. FICKES, Pittsburg, Pa.: There are a number of points in Dr. Fletcher's paper which I would like to discuss, but I will confine my remarks to a few of the more important of these.

He gives a fairly accurate description of the clinical aspects of the disease in its early stages. His idea of the etiology corresponds with the conceptions of many able writers on the subject, viz., that the disease is caused by wounds or injuries to the soft tissues adjacent to the teeth, through which infection occurs, and that general conditions of the body may or may not have some influence as factors in its origin.

The essayist states (p. 2, pgh. 3) that in order that the different stages of the disease may be defined and described . . . the term "Alveolitis" will be used in place of the term *Pyorrhea Alveolaris*, and he gives a classification which is intended to include, if I understand the context of the essay, the various pathological conditions commonly known as *Pyorrhea Alveolaris*, from their inception as marginal gingivitis to those more serious conditions which result in the loss of the teeth. He defines the term "Alveolitis" as "a disease of the bone which supports the teeth and involves the overlying gum tissues; also the periosteum and peridental membrane." I will not enter into a lengthy discussion of the nomenclature of this disease, but I wish to say that the terms used to describe a disease and its various phases should not be misleading as to the pathological conditions usually present. While *Pyorrhea Alveolaris* may not be a scientific name for the disease, it is more descriptive than the term *Alveolitis*. Pus flows from the alveoli or tooth sockets during most of the progress of the disease, even though it be not visible to the casual observer; whereas inflammation of the bone may or may not be present.

The essayist also says that the disease results ultimately in the loss of the tooth by destruction of the bone. This is true, but not usually because of infected bone, as the writer would lead us to think, but from absorption of the alveolar process. I do

not mean to imply that the bone is never involved, but that it is not so in the large majority of cases. If carious bone were present the logical treatment would be to remove it in order to prevent the progress of the disease, but if the bone were absorbed curettement would be contraindicated.

The writer says, "After the onset in the gums and the alveolar process has become involved, the malady is *primarily* that of the bone, that of the gums being *secondary*." By usage, the word "primary," in relation to pathology, means the beginning, or first stage, and "secondary" the next stage of a disease; but in order to use the word "primary" to the best advantage in his argument in favor of the term "Alveolitis," he uses it as meaning principal or chief, and relegates the infected soft tissues to the "secondary" place in pathological importance. If you will excuse a homely expression, the writer has "put the cart before the horse."

The writer states, "As to recovery, it should be borne in mind regarding the deep-seated cases, that . . . it takes the cementum longer than the bone to repair, and it is the cementum upon which repair is most dependent." An understanding of the histology of the parts and the physiological functions of the various tissues involved is fundamental to a correct conception of the pathology of this disease. The important points in relation to these have been determined. Repair of cementum and the bone of the walls of the aveoli are primarily dependent upon the cementoblasts and osteoblasts of the peridental membrane. The cementum has no power of self-repair, but can only be repaired by the cementoblasts. This process of repair can only take place in uninfected areas. If the peridental membrane is destroyed this repair cannot occur. The gingivae, peridental membrane and alveolar process form the attachment and protection for the teeth, and these are dependent for their vitality upon that attachment. The building in of the principal fibers of the peridental membrane with cementum by the cementoblasts, when they have become detached, is essential to a cure of pyorrhea alveolaris. If the peridental membrane is detached and infected or destroyed, the complete cure of the case is impossible. The gingivae and alveolar process are absorbed. Prompt preventive measures are necessary in the early stages of the disease to avoid permanent injury to the tissues. The first signs of marginal gingivitis should be promptly treated and the cause removed if we are to expect to prevent incurable injury to our patients.

Pyorrhea Alveolaris is primarily a disease of the soft tissues—infection of the gingivae and peridental membrane—and on detachment of the peridental membrane there follows the *physiological process of absorption* of the alveolar process, though it is sometimes complicated by infection and death of the bone. If such is not the case, is it not strange that the disease usually disappears on removal of the teeth and that it never occurs in edentulous jaws?

The progress of the disease and the extent of the injury depend largely upon the physical conditions which disturb the anatomical relations of the tissues, the physiological functions of repair of the various tissues involved, the number and virulency of the bacteria present, and the action of the defensive proteids and phagocytes of the blood.

In the latter part of the paper reference is made to the systemic effects of suppurative conditions of the tissues adjacent to the teeth. This phase of the subject is of great importance, and too much emphasis cannot be made of the effects of oral sepsis on the general health. It is an impossibility to keep the mouth sterile, and injuries to the soft tissues, especially to the gingivae and peridental membrane, which are liable to become suppurative wounds, are extremely dangerous to life and health.

DR. J. H. CRAWFORD: I wish first to congratulate this Society upon the fact that Dr. Fletcher agreed to come here and speak to us on this subject. The essayist's position in the medical and dental world of scientific investigation and also as a writer and practitioner is too well known to need any elaboration at my hands, but I do feel it a privilege to stand here and say to Dr. Fletcher, "You and the message you bring are welcome in our city."

It was with pleasure a few years ago that I wrote to Dr. Fletcher, thanking him for suggesting to me a name to be used as a better substitute for the overburdened, overworked term "Pyorrhea." It is with even greater pleasure that I take this opportunity of thanking him for coming here and adding his authoritative voice to my feeble arguments in favor of a better nomenclature, a rational classification of mouth diseases, a differential diagnosis of these diseases and a rational treatment for their relief.

We have been too long "scaling teeth," "planing roots" and "polishing exposed surfaces" and blaming our failures upon "uric acid conditions." We have been too long playing the ostrich and hiding our heads—blinding our eyes to the principles and practices which have brought surgery to its present state of advancement, refusing to relate these principles and practices to ourselves and the mouths intrusted to our care. We have been too long looking at the little cavity in the tooth and failing to see the larger, more serious, more important cavity—the infected and infecting mouth. We have needed somebody remarkably like Dr. Fletcher, with his own personal message, and that of Dr. Hunter to waken us into a realization of the responsibilities devolving upon us as dentists. We have him here now. Let us see if we cannot profit by his presence and his message, since he has designed his paper for the dentist and not the specialist, since he has aimed at the specific truth rather than at the sky or at any fine spun theories.

He says, "Please do not spare me since it is the truth we want." How altogether too bad it is, then, that he has taken the side I want, has said the things I have been saying ever since I began to read all of Dr. Fletcher's articles that I could find in print. I can't stultify myself even to raise an argument, so I must say, as little Bobby Byrne of the Pirates said to big Pitcher Kellogg, "I want to be on your side."

I heartily endorse the effort of the essayist to classify these diseases and name them according to some rule—even if it be only a rule of stages. One point in which this classification might be improved or made more definite might be to start the series with Gingivitis and to include in the list Syphilitic and Tubercular Alveolitis as distinctive mouth conditions, differentiated from mouth conditions due to purely local initial infections. While discussing the nomenclature of these conditions I would like to pass on the suggestion handed to me recently to distinguish between the terms carious and necrotic as applied to those portions of the process affected in these diseases. To my mind these exposed portions of process are carious and not necrotic.

However, this point is of comparative incidental value compared with the fact that there is *frequently diseased bone surrounding or adjacent to these affected teeth*. That's the point worth driving in, and the recognition of modern surgical methods in dealing with this diseased bone is absolutely essential to success in the treatment of these cases. What does a surgeon do with a diseased or dead bone? Does he apply astringents to the skin over it, or antiseptics to the surface of some adjacent soft tissue or scrape a scab off the skin somewhere near it? Isn't that right close to what we do when we scale the tartar off the roots, prescribe an astringent or antiseptic mouth wash and then, because we don't get the result desired, continue this monthly manieuring and dosing and hoping? Such methods won't cure anything except a simple marginal gingivitis, and I dispute the advisability of such practice. One friend of mine said the other day that he had kept planing a root for so many times that he had gone thru the momentum into the dentine. Why didn't he and why don't you and I accept the results of surgical experience, locate the diseased bone and cut it out with chisels, curettes and burs instead of perpetually planing the roots until we penetrate porous dentine?

I thank the essayist for designing and having put onto the market the chisels and burs which have been of such great service to me in so many cases. Planing instruments are essential for the thorough removal of deposits from the roots, of course, but they are not any more essential than the proper use of bone-cutting instruments for the removal of infected bone, without which no case of alveolitis was ever materially benefited. The burs are more rapid in their operation and less painful than chisels and curettes, but the delicacy of touch necessary to distinguish between carious and necrotic and healthy bone is better developed by the use of the latter instruments.



I would like to emphasize two statements of the essayist which, though they seem to be at variance with the opinions of most of my confreres, are, in my experience, so absolutely and uniformly true that they may be used as a diagnostic sign as to whether our work has been done well or ill. The statements are: "No amount of gum treatment will cure alveolitis" and "With these bony tissues once well the gums naturally recover." The inverse is equally true: unless these tissues are well or are made well, the gums will not recover and we will keep on scraping and planing and astringenting and antisepticing and hoping in vain. *Every tooth, which, together with its contiguous soft tissues and supporting and surrounding bony tissues cannot be put into and maintained in a condition of health, absolutely free from flow or exudate of pus or retained infection, should be extracted.*

This means that those teeth requiring the monthly manieuring should be eliminated from the mouth so that a clean mouth may be had 365 days in the year instead of just the twelve afternoons when the patient is in your office. Too many of us are trying, by this monthly polishing process, to retain teeth which, because of our ineffectual operation, are discharging pus into the mouth or sending it into the blood stream.

Regarding the use of medicines, the essayist practically limits himself to the only two drugs which I ever feel the need of in this work, and the need of these drugs, it may be remarked, is caused only by the imperfections in our operations. If all carious and necrotic and infected bone and membrane and foreign material is removed, blood clot allowed to form and can be protected, no drugs need be used. When this is impossible or impracticable, iodine for its penetrative, antiseptic, stimulating properties and pure lactic acid for its pus destroying, bone stimulating properties fulfill all requirements.

I should like to have had the essayist touch more heavily upon the influence of a congested circulatory system upon the repair of these tissues and tell, in his clear, concise manner, how this repair takes place, because it is a beautiful and interesting picture, but I realize that he has already given us a lot more than we deserve and probably more than most of us can digest, so I will, in closing, add only my hearty thanks to the essayist for his presentation of the subject and for the privilege of discussing it.

DR. A. W. McCULLOUGH: In all operations about the mouth, cleanliness and carefulness, together with thoroughness and exactness, are among the first principles to be observed.

The essayist has told us that surgery is that branch of medicine which treats disease wholly, or in part, by manual or operative procedures—Alveolitis probably requiring more surgical skill, and less mechanical, than most operations the dentist is called upon to perform; its destructive work being done below the gum line rather than above, in bone and deeper surrounding structures rather than tooth or gum. The treatment of gum, the treatment of tooth, alone, will not suffice to effect a cure after the disease is fairly well advanced. But the beginning, the commencement, of this most destructive disease of mouth or body throws out its first signs, first indications, usually by a little tartar deposit, malocclusion, or faulty operative procedure. Now, why could this not be detected by the observant operator in its very early stages, and prevent the ills we are later called upon to heal? The essayist has little to say about the constitutional causes, or rather gives the idea that the constitutional causes have little effect. We question whether constitutional conditions alone ever do bring about pyorrhea. We do not believe constitutional treatment, without freeing the mouth of the local exciting conditions, would effect even the signs of a cure; while the proper local treatment, without the constitutional, will effect a healthy condition. Therefore, the man who would successfully cope with this disease must familiarize himself with the prophylactic and surgical treatment, as the greatest shortcoming in the successful treatment of this disease in its advanced stages is the lack of thoroughness in reaching and removing deep-seated deposits and dead bone. The essayist does not think the removal of all dead bone necessary. I think the removal of all deposits and dead bone ultimately necessary. If a local anesthetic is not sufficient, I would not hesitate to use a

general, and would remove all to sound, healthy tissue, unless, in removing such, you were endangering other oral conditions, possibly deformity, or otherwise making it impracticable, you should then stop short of complete removal. Nature is a wonderful restorer, a wonderful repairer, if given half a chance, and undoubtedly helps to cover up many otherwise defects; but it cannot repair dead bone, and would require quite a much longer time to effect a return of healthy condition if Nature be required to throw off too much dead tissue. Lack of thoroughness causes lack of cure. At best, where bone and cementum are to effect a repair, it requires quite a long time, six months to a year, while in bone alone, as a fracture would be, four to six weeks would give good results; eight to ten, practically complete recovery of strength. When we take into consideration what a destructive disease Alveolitis is, causing loss of more teeth, more mouth disorder, than any other one condition, together with a great many systemic disorders and bodily diseases; and, if its origin, as the essayist has shown, principally comes from local conditions, could we not, if we were as efficient and possessed ourselves with the necessary armamentarium, inform ourselves with the proper knowledge and ability of searching about the necks and sockets of the teeth—especially of our younger clientele—for infected arcas of diseased bone, and were able to diagnose and intelligently treat decayed bone and its kindred accompaniments, which is more prevalent than decayed teeth, and to do this with the same exactness that we do our cavity preparation, our results should be correspondingly successful, and a man with ten years' clientele following should be a great deal more chagrined with finding an "Alveolitis" development in one of his patients than that of a broken-down restoration.

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## MAKING A GOLD CROWN FOR ARTIFICIAL TEETH, AND PREPARING AND FILLING CAVITIES IN ARTIFICIAL TEETH\*

By Dr. J. O. Hawkins, Wellston, Ohio

Very often the dentist is called upon to make and put in a gold crown in an artificial set of teeth, whether or not it is professional or ethical so to do. I think that I have a plan that has not been demonstrated, and it is a good one and by it a gold crown, suitable to put in an artificial set of teeth, can be quickly made. My experience has been that a patient seldom wants a crown back of the cuspid, and of course wants it where it will *show off to the best advantage*. Nearly every dentist in this age has the Hollingsworth or some other system of making cuspid, lateral and central incisor crowns. I use the Hollingsworth system. If I want to make a cuspid I take the artificial cuspid that I am going to replace with the gold crown and I select a form as nearly like the artificial cuspid as possible, place a rubber ring over it and run fusible alloy in and over the form to make the die. Now take a piece of 30-gauge gold large enough to make the labial portion of the crown and use a piece of lead for a counter die and swage up the labial portion of the crown. Trim off the edge and solder two thicknesses of 30-gauge gold to the back, and finish as usual. After the crown is finished take your dental engine and drill some small holes in the back of the crown, so that the rubber will run in and form an attachment to hold the crown on the plate. I have made quite a number of crowns this way and I have never had one to come off, so far as I know.

\*Clinic at Ohio State Dental Society.

The dentist is, also, very frequently asked to put gold fillings in artificial teeth, and every one who has done this knows that it is harder to cut and fill a cavity in an artificial tooth than it is in a natural one. The instruments that we have been using heretofore are not suitable for cutting cavities like we cut in natural teeth. I claim that a filling in an artificial tooth should look like a filling in a natural tooth. The instrument that is generally used is the copper disk, used with some kind of grit. You cannot cut a natural-looking cavity in this way. You cut an oblong cavity, up and down the tooth, and it does not look natural when filled. I have thought for years that there should be small carborundum wheels and points made to cut the main portion of the cavity with, and we can get these stones now. The Carborundum Company of Niagara Falls, N. Y., are now making points that are well calculated for cutting cavities in artificial teeth. These, with a good extended diamond point drill, make a good outfit for drilling. Carborundum points No. 162, Grit D, are the ones that I use. I grind out the cavity with one of these points the size and shape that I want it and then take a diamond drill, with an extended point and drill two retaining pits in the cavity, one at the extreme end, upper and lower. This will afford all the anchorage that is necessary to retain the filling. By this method I can cut a cavity in five minutes. One carborundum point will cut several cavities and you will not have to use some dirty black grit, as you do with the copper disks, and get your instruments and hands all black by so doing.

Up to a few months ago I have been worried more with trying to get good looking fillings in artificial teeth than any other one thing that I have had to contend with; but it is a pleasure now for me to cut and fill an artificial tooth.

This clinic on these two subject is given, not because I approve of either of them, but because we are called on to do this kind of work, and I am sure I have demonstrated how it can be well and nicely done.

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## USE OF CARBORUNDUM STONES IN CAVITY PREPARATION.\*

By Jos. C. Sheets, D. D. S., Massillon, Ohio

A rapid and almost painless method by the use of carborundum stones for reaching cavities located in the approximal surfaces of bicusps and molars and for cutting out infected grooves and pits in same. For the approximal cavities I use the S. S. W. mounted stones, cutting through until cavity is reached. The rest of preparation can be done in the usual manner with chisels and burs. For opening and extending infected grooves I use the Lee H. Smith & Sons mounted carbo.

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\*Clinic Ohio State Dental Society.



## THE RELATION OF THE ORAL HYGIENE MOVEMENT TO THE MUNICIPALITY

*Continued from Page 631 August Summary*

### **The Relation of the Anti-Tuberculosis Movement to the Dental Profession.\***

**By Samuel Iglauer, B. S., M. D., President Cincinnati Anti-Tuberculosis League,  
Cincinnati, Ohio.**

The dental movement and the anti-tuberculosis crusade have much in common, since each is an important link in the chain which preventive medicine is binding about disease. The diseases which the dentist encounters are the most common to which flesh, or rather bone, is heir, while the physician recognizes in tuberculosis the "Captain of the Men of Death." Both movements owe their inception to two great discoveries. The announcement by Koch of the infectious nature of tuberculosis and its mode of transmission brought with it a social and a moral obligation upon the medical profession to familiarize the world with the knowledge necessary to combat the "Great White Plague." In a similar manner one of Koch's distinguished pupils, the late Dr. Miller, brought home to the dental profession the microbial and, therefore, preventable origin of most dental diseases.

It is an axiom in medicine that the discovery of the cause of any particular disease means that in the long run its prevention, or cure, is possible. In proof of this we need only recall the progress already made against diphtheria, cholera, plague, anthrax, typhoid fever, malaria, yellow fever, cerebro spinal meningitis, etc. The diminution in the death rate from all these scourges in all civilized countries, as well as from tuberculosis itself, makes us hopeful for the ultimate conquest of tuberculosis; while the most prevalent of all human ills, dental caries, may eventually be subjugated.

The dental and anti-tuberculosis movements are, however, greatly handicapped because both are directed against diseases so widespread throughout the world and so insidious in their onset. The diseases which both movements seek to overcome have been with us so long and society has become so accustomed to their presence that by some they are regarded as almost inevitable, and the parasites have finally come to be regarded as integral parts of their hosts. Familiarity with disease often breeds contempt for the same, so that preventive medicine and preventive dentistry have to encounter the ignorance, superstition and inertia of a public unmindful of its own best interests.

If any movement for social betterment, such as the dental or the anti-tuberculosis crusade, is to be crowned with success, society must be awakened to the necessity for its own salvation. It has, therefore, been found

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\*Read before the Cincinnati Dental Society, 1912.

necessary to make propaganda through the lecture bureau, the press and the public clinics, and, above all, through the public schools. In the instruction of school children, especially, lies the strength of both dental and the anti-tuberculosis movements. Both have concentrated their efforts upon the coming generation of citizens and, I might add, of voters.

While society is already keenly alive to the unnecessary waste of life in the mine, in the factory, on the railroads and on the sea, the next generation will be more alert and more appreciative of the doctrine of conservation—conservation not only of material resources, but what is more important, conservation of health. In time an enlightened public will demand of the State that it take as active a part for the prevention of human ills as it now does for the prevention of diseases of plants and animals.

In attacking all of these problems the social worker, the philanthropist, the dental and the medical profession can but point the way and set the machinery in motion; but the task of continuing the work is too stupendous for these, acting unaided. The solution and control of all movements for the public health must finally rest with the State. The formation of a National Bureau of Health, so long delayed but now in prospect of consummation, is a great step in the right direction. Not only the nation, but also the state and the city, have an important part in this great work. Through the united action of a progressive government cooperating with an enlightened citizenship, we may hopefully look forward to final victory over preventable diseases.

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### Relation of Education to the Dental Movement.\*

By Dr. F. B. Dyer, Superintendent of Public Schools, Cincinnati, Ohio.

I see the inscription, "Here comes one with a paper." In my case, here comes one without a paper. I did not understand the formidableness of the occasion or I would have had one. Ideas on child welfare are as prevalent as microbes, and a superintendent of schools is expected to catch every one of them. But a superintendent has to exercise caution, and I hesitate to talk to specialists on their specialty. Artemus Ward said he learned in Arizona, when he saw a snake hole, that "that 'ere hole belonged to that 'ere snake," and he walked around it. I have learned the same thing, and instead of talking about this subject I will talk around it.

The world is just waking up to the importance of the physical nature of the child, and it is high time. If we can trust our medical inspection—and I think we must acknowledge that we can—we find that in our own city 33 per cent of our children have defective eyes, 65 per cent have defects of the ear, nose and throat, and 90 per cent have defective teeth and mouths. When we add that all up, I should like to know what is left. It is time we were taking a firm stand to secure the proper condition of our children. The fact is, most of us are stunned by the conditions and are

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\*Address before the Cincinnati Dental Society, 1912.

not quite ready for action. We cannot take seriously the statistics that are found. Still we have no right to discredit them.

Some time ago it was said, "What is a tooth?" It is like the nursery tale: "For the want of a nail a shoe was lost; for the want of a shoe a rider was lost; for the want of a rider a battle was lost." As these gentlemen present have been building up these clinics in our schools and with their literature are showing the seriousness of the neglect of the mouth, we feel that there is something in the old nursery story and, without the tooth, the child may be lost. At least we feel that the matter is of great and most pressing importance. Personally, I feel that the child loses more time, suffers more, loses more of the benefits of his school period because of the toothache than because of any other one defect or disease. I can go back to my own childhood and bear out that statement. Thousands of children are tortured with their teeth. There is the resultant indigestion, the lack of assimilation of food and a nervous condition that prevents children from attending to school studies.

The desideratum is a way to get the attention of the public. I believe that the city should pay the bill instead of accepting it as an act of philanthropy from the Dental Association. There has been little objection to medical inspection in general from the parents. I am in a position to know, because my basket is always filled with anonymous letters on every subject connected with the schools. Occasionally one finds fault with Dr. Landis, too. One mother came to see me to find out why her child alone should be excluded from school. She could not understand why her child should be excluded until her hair was washed with some solution prescribed. I told her the reason why. That made no difference; what kind of a country was it, where all were not treated alike? I had to reason with her as to what equality actually meant.

Another excited lady came down from the hill and wanted to know by what authority her child was subjected to dental inspection? I answered her with equal vehemence: "By the authority of the great Jehovah and the Continental Congress, or by the authority of the Board of Health, which amounts to the same thing." We had some vigorous words. Among other things she said: "They are using the same instruments in my child's mouth and in others without sterilizing them." I did not know that. I asked her if she had been there to see this. She had not. I said: "Well, I have been there, and I know they are taking more precautions than the ordinary dentist does." She said: "They tell me they are just green students whom they are breaking in." I assured her that there were sixty-five men doing this work who ranked as the leading dentists of Cincinnati. She went on: "Well, I do not care. What is the use of sending home these reports? I do not believe a word they say." I told her she was rather hard on the dentists, as hard as Euripides was on women. Euripides said: "Believe no woman, though she speak the truth." I finally told her I should be very glad to have her see Dr. Landis. She said, "I know him,



and he is a gentleman." "Then," I said, "I know he will be delighted to see a lady who has the distinguished honor to be the first to object to the dental inspection." I learn since that she is wholly converted. I acknowledge that my own views on dentists and the importance and character of the profession have changed, and I did not blame her at all. As was stated in a certain part of the Scriptures, "Barabbas was a robber." If I had rewritten the Scriptures, I would have written "Barabbas was a dentist." But recent experience with this profession compels me to say that these gentlemen are in as high a class of philanthropy as are the medical profession. My family dentist now runs neck and neck in my esteem with my family physician. The dental profession is gaining the position it deserves. They themselves have done much in this direction by their opposition to the charlatan dentist and his methods. I used to congratulate myself when I escaped the dentists. I was like the country fellow who came back from New York, elated because he beat the sharks out of fifteen dollars. He said, "I did it by not letting them know I had it."

I believe that this movement in our schools has been the most important one, for the profession as well as for the children, that has transpired in the history of the dental profession. Nine hundred and twenty children in one of our schools were examined in 1909. Not ten had had dental attention. In the examination in the same school the next year, 25 per cent, that is two hundred and fifty children, had received dental attention. That was the result of the work done the year before. That speaks loudly for the awakening of the people.

I will close by saying: "Gentlemen of the dental profession, I am convinced; I am with you."

## THE PAINLESS PREPARATION OF CAVITIES BY THE USE OF NITROUS OXIDE AND OXYGEN\*

By A. E. Mann, Findlay, Ohio.

THE use of oxygen in combination with nitrous oxide has not only opened up a new era in its use, but in reality a new era in the practice of dentistry. This especially from the standpoint of the laity. The possibilities of this combination of gases and the improved appliances for its administration is opening up a new field for the skill of the dental surgeon. This new field is the use of a general anesthetic for relieving the pain of cavity preparation, grinding abutments, fitting bands, opening into teeth with blind abscesses, etc. This is done in the first or analgesic stage, and the technic is as follows:

First and most important, gain the confidence of your patient. This is more easily done if you have a lively amount of confidence in yourself. Your suggestive assurances of no pain, no distress, no being asleep, etc., will then carry weight with the patient. While assuring the patients that

\*Given as a clinic at Ohio State Dental Society.

everything will be just as pleasant as they could wish it, also tell them that they can greatly assist you by remaining quiet in the chair and completely trusting you, and should they at any time not have enough of the anesthetic to prevent pain, simply to raise the hand. If a lady patient, always have the clothing around the waist loose, corset off preferably, if you have a lady assistant and retiring room. Bladder should be empty, and if you can make a previous appointment have them eat only a light lunch before coming. These little things are the keys of success.

Have nitrous oxide bag about half full to start with and the oxygen bag entirely full. Adjust nasal inhaler with air valve open and insert Justi prop. Then instruct patient to breathe rather deeply through the nose at first and to continue to breathe through the nose all the time. Instruct them that they will soon feel a peculiar exhilarating feeling accompanied by a partial numbness, but not to pay any attention to that, as it is necessary, and to be quiet for you won't hurt them: also tell them, and this is important, that they will hear you work and feel you working on the teeth, but so long as you are not hurting them to pay no attention to the instruments and noise of drilling. It will rarely be necessary to have the patient become unconscious, especially patients who will use a little of their own reasoning to assist you. Extremely nervous patients who cannot apparently "give up" and who would be frightened at the sight of an instrument may have to be carried into a deeper state. The patient during this period of instruction is breathing only air, and good subjects will begin to feel the numbness before you have turned on the gas.

Now open gas valve for a few inhalations, keeping this bag at all times only partially inflated, in fact nearly empty, heater tightened. Now open oxygen valve and advance it to the fifth or sixth notch and keep gas flowing into this bag so as to keep it well distended all the time. In about two minutes you will notice that the patient is experiencing that exhilarating feeling and you can commence to operate along the edges of the cavity. Don't be in a hurry, or rather, make haste slowly, as you might frighten the patient. Keep up a running conversation all the time such as, for instance, "I'm not hurting you in the least, am I?" "That is pleasant to take, isn't it?" "You will tell all your friends when you go away how fine this new method of filling teeth is," etc. This reassures patients and helps to keep them awake and their minds occupied with pleasant thoughts.

If patient passes into unconsciousness, shut off the gas entirely for a few moments, or if they become cyanotic advance oxygen to eighth notch.

The technic is simple and a few cases will soon give the operator confidence in the method, and then he would rather give up the practice of dentistry than be without his appliance.

Dr. De Ford of Des Moines, Iowa, has written a most excellent book on the use of anesthetics in dentistry, and its careful perusal is to be strongly recommended to any practitioner before even purchasing his appliance.

**ANESTHETIZING THE DENTINE WITH LOCAL ANESTHETICS\*****By Dr. L. J. Smith, South Bend, Ind.**

I came here last evening expecting to demonstrate a feature in dental work that I thought would interest you—anesthetizing the dentine with local anesthetics, using Nontoxo, which is a solution containing no cocain. I find that my time is so limited that I will be unable to remain long enough to do this. Perhaps I can explain it to you so that you will understand.

The procedure is very simple. This little operation that I speak of is one of those things that help us out, many times, in hard places. We all know that the cervical cavities are keenly sensitive and hard to handle, many times, and the operation of anesthetizing with this preparation is very simple. An injection is made just above the gum margin in such a way as to engage the peridental membrane, especially between the teeth where it dips down and all around the tooth, being careful to infiltrate the tissue thoroughly. Then wait about ten minutes—sometimes longer or less—and you will find that the dentine is thoroughly anesthetized by way of the peridental membrane, which conveys it to the root. Frequently the pulp may be so anesthetized that it can be removed, if there should be occasion for so doing. The advantages of using the local anesthetic are quite considerable. This may be done with cocain, but when performed with cocain we find that very frequently a congestion of the pulp follows and future trouble results. The Nontoxo does not affect the pulp, and the action remains for about three-quarters of an hour, or thereabouts, which is sufficient time in which to perform the operation. The effect then passes off and the patient is well pleased, and you are relieved to get rid of a tough job in filling a dental cavity. It applies to the treatment of all the cavities, for that matter, of the anterior or single-rooted teeth.

There seems to be a difficulty in anesthetizing the molar teeth. I think that is because there are two or three pulps to be encountered and you don't get them all, but success follows this method in all the anterior teeth, and usually the bicuspid can be treated in this way and filled. It is a very simple operation and one that I hoped to be able to demonstrate to you, but failing in that and having only a few minutes, I shall thank you for your attention and invite you, when you come to South Bend, to look me up, when I shall be very glad indeed to have the pleasure of meeting you.

\*Clinic Southwestern Michigan Dental Society.

**A METHOD OF REFITTING ARTIFICIAL DENTURES\*****By L. E. Day, Columbus, O.**

Warm modelling compound and spread over plate. Insert in the mouth and order patient to close to get proper occlusion. Harden compound by using cold water, remove, trim edges to suit, invest in flask, warm flask to soften compound, separate, remove compound and roughen old rubber by using large burs or carborundum points. Pack, vulcanize and finish.

\*Clinic Ohio State Dental Society.



## REGULATING APPLIANCE INSTRUMENT FOR REMOVING COMPOUND INLAYS.\*

By Dr. J. H. McClure, Wheeling, W. Va.

A regulating appliance designed to put into place a tooth striking inside the lower arch, principally the sixth anterior.

The appliance consists of a roll collar secured to the tooth to be moved, to which is soldered a strap of gold, which holds in place a short piece of watch spring or clasp metal, the ends of which rest upon the two adjacent teeth to the one banded, thus producing traction and moving the banded tooth into proper occlusion.

Also an instrument for the removal of compound inlays. This instrument consists of two prongs, which are moved into any position desired by a knurled nut, giving two points of contact on which wax impression can be made, and lessening the liability to distortion.

\*Clinic at West Virginia State Dental Society.

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## HOW TO CAST AN INLAY WHEN YOUR CASTING MACHINE IS OUT OF ORDER.\*

By Dr. W. J. Boydston, Fairmont, W. Va.

The casting machine consists of a tube about eight inches long and about an inch and a half in diameter, filled with plaster of Paris to within about two inches of the top. Fill this vacancy with putty or moldine. Over this place wet tissue paper, about six to eight thicknesses. Heat your investment and proceed as in other casting, exerting about six to eight pounds of hand pressure.

Then this other crown is a porcelain-faced cap crown, by use of Steele facing with cast back. You grind your tooth the same as for a gold crown; then grind buccal surface the same as for Richmond crown. Then cut face of band out; swage your cusp and catch it on the lingual edge of band with solder; readjust to tooth; allow patient to bite and adjust articulation. Then grind Steele facing to approximately fit portion of band ground away; cut back the facing with vaseline; press it into warm casting wax and while still warm place on face of band. Press into place, chill, remove, trim, and build up contour with wax. Remove facing, insert screw in the buccal incisor edge of wax; invest, and proceed as in other casting. After casting flow solder around cast and band. Grind down and finish and place in facing.

\*Clinic West Virginia State Dental Society.

## REGULATING CASE, SHOWING X-RAY PICTURES AND MODELS.\*

By Dr. W. E. H. Caldwell, Wheeling, W. Va.

This is a case of a young lady 18 years of age; an unerupted cuspid tooth in the right superior, and deciduous cuspid still in position but badly broken. The cuspid tooth was found to be lying on the palatine surface of the mouth and occupied a position mesially, the cuspid being between the roots of the lateral and central incisor, and the apex of the roots being opposite to the mesial surface of the first molar. This location was proven by a radiograph, and the operation was as follows: Partially desensitized, and a portion of the tissue removed from the inside of the tooth. A round hole was drilled with a No. 1 half burr in the direction of the long axis of the tooth, and threads were cut into this and a gold screw with a hook attached placed in position. The central incisor and first bicuspid were banded to the other, but dropped down well to the incisor edge. Rubber ligature was then placed over the hook on the cuspid tooth and tied to the bar. Thus there was sufficient pressure to draw the cuspid tooth into position. The case is at the present time not complete and it will be necessary, before the desired results are acquired, to expand the arch slightly.

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\*Given as a clinic West Virginia State Dental Society.

## BACKING AND REINFORCING PORCELAIN FACINGS IN BRIDGE WORK.\*

By Dr. D. C. Clark, Blacksville, W. Va.

First grind porcelain of tooth to a knife edge on the cutting point. Use 24k and 35-gauge gold for backing, burnishing down to fit slant on end of tooth. Remove backing and flow 22k solder across the tip. This tip corresponds to the slant previously ground on the tooth. Replace on the tooth and also place another layer of the same grade and gauge of gold to make it less liable to burn through. Leave the backing extending on all edges of the porcelain tooth; then place in my bridge or have Richmond crown and make my general solder-up. This solder-up is made with a lower karat of solder than is used on my tip—either 14 or 18. The two objects of this are, first, to be sure you have the tip in your general solder-up; second, to protect your porcelain.

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\*Clinic West Virginia State Dental Society.

## INTERCHANGEABLE PIN-FACING IN CROWN AND BRIDGE-WORK.\*

By Chas. A. Priest, Marion, Ind.

The ordinary facing is backed in the regular way and then waxed up with inlay wax to the shape desired (or the facing can be waxed up without backing).

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\*Clinic Indiana State Dental Society.

The porcelain facing is removed and carbon points are inserted in the pin holes left in the wax. The form is then invested and cast in the usual way. The carbon points are then removed and the facing cemented to place. (The carbon points for this purpose may be obtained at any dental depot.)

## CAST BACKINGS AND CROWNS FOR STEELE'S FACINGS.\*

By James B. Doyle, D.D. S., Grand Rapids, Mich

First take the Steele facing then a piece of platinum or pure gold, about 36 gauge. Pinch it together and insert it in the groove, then take a small instrument and burnish it to place so that it fits the groove perfectly, then take a piece of 22k plate gold or platinum and cut it so it will readily pass into the root canal and the groove of the facing. Remove and solder these two pieces together; after greasing your facing with vaseline you are ready for your inlay wax. Mould it as well as possible to the back of the facing and your root canal pin. Then after the wax is properly warm you insert it in the root canal and press up firmly. Remove and carve until you have the shape desired. Then remove your facing and you are ready for casting. Now you have a perfect fit of your facing to your backing and a perfect fit to your canal.

I cast all my backing for Steele's facings. You proceed in the same manner except that you do not use a pin. There is a great advantage in making bridges with Steele facings and casting your backings. The reason so many facings break is because you cannot get uniform thickness with solder. You will get a little more solder in one place than another and it is liable to spring. That spring will be just enough to crack your facing. And another thing, you cannot always get your backings to fit so that the stress of mastication will come upon it. By casting your backings you overcome these difficulties.

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\*Clinic Southwestern Michigan Dental Society.

## A NEW INLAY BARNES' INLAY METHOD USING ARTIFICIAL GAS.\*

By Dr. Henry Barnes, Cleveland, Ohio

Any soft gold (not absolutely non-cohesive) rolled into a ball and condensed in the cavity, using orange wood forms. Points used: Crescent, V-shaped, for burnishing over margins. For packing: Crescent, V-shaped, rectangular, square and round. These points, whittled to size suitable for cavity being inlaid. Gold condensed within the cavity, contoured as desired in finished inlay in the mouth. Remove the condensed gold from the

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\*Clinic Ohio State Dental Society.



cavity, placing on charcoal block; 22k plate infused therein until the inlay matrix has absorbed sufficient plate. Return to cavity for determination of correctness and, if found to be correct, finish and set. No investment; no wax; no flux; no solder, and no machines. Lane mouth blowpipe used.

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## **BACKING UP DIATORIC AND VULCANITE TEETH FOR BRIDGE WORK, USING MAT GOLD.\***

**By G. W. Emery, D. D. S., Cadiz, Ohio**

Grind any tooth ready to back as in any case for bridge, then place the tooth, face down, into the lower band of your swager (I use a Lauderdale), which is filled with vulcanite (red preferred). Then cut a piece of gold (any of the mat golds) the size needed to fully cover the back of the tooth to be backed, press it down on the tooth with your fingers (as this gold is not to be welded). Then place a small piece of oiled paper over the gold to keep the vulcanite plunger in the swager from sticking to the backing; use any ordinary plunger swager and the backing will always fit. You can use this method if you use gold plate for backing, swage it and save time and get better results.

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\*Clinic Ohio State Dental Society.

## **PLASTIC GOLD FILLING.\***

**By J. N. Anson, D. D. S.**

I have been working on a plastic gold filling since about the first of December, 1910. It is in reality a gold concrete. The filling consists of powdered pure gold and oxyphosphate cement powder, mixed in proportions of 18 parts pure gold to 6 of cement, by weight.

This combination powder is then thoroughly mixed with the cement liquid to a creamy consistency and allowed to set till in about the state of amalgam. Then it is cut into blocks and inserted into cavity similar to amalgam, with amalgam instruments.

The advantages are: (1) Ease of manipulation; (2) Little cavity preparation; (3) Great saving of time to both patient and operator.

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\*Clinic Lake Erie Dental Society.

## **SOME STUNTS\***

**By Dr. W. A. Loope, Cleveland, O.**

1. Heat your metal hypodermic syringe point and melt a small piece of lead solder onto it, then wipe it while hot with an old towel, as a plumber wipes a lead joint. A small drop of acid flux will make it stick better. Replace the needle and set it tight with wrench. You have insured yourself against all chance of the syringe leaking about the needle in the future. Throw away all washers, for every needle sets tighter than the last. It's boilable, too.

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\*Clinic at Ohio State Dental Society.

2. Before you boil out wax from flasks or investments, place a base from a broken upright mantle in the opening of the wash-bowl. It makes the best fitting strainer, costs you nothing and saves bridge teeth clasps, and that may be loosened with the wax.

3. A squirt-gun, like the one you used when a boy, is an ideal way to use hot water in forcing out wax from investments and flasks. It's done thoroughly and in a quarter of the time required pouring the water.

4. Utilize the next back comb or hairpin you pick up by the chair. Cut off the points and shape them up to work silicates with. They are easily mounted on your old broken instruments by drilling a small hole with a round bur and setting with dry shellac (orange wood), heating the instrument point.

5. Try mixing amalgams in a finger cup of rubber. It's clean, and heat of hand helps.

### EXTRACTION, USING SOMNOFORM

By Dr. S. M. Fowler, Battle Creek, Mich.

Dr. Fowler administered Somnoform and extracted sixteen very bad teeth, under one administration, and could have extracted more if the man had had them. The entire operation took not to exceed three minutes from the time he commenced administering the anesthetic to the time it was all over and the patient up and talking.

### NITROUS OXID AND OXYGEN—ITS FIELD IN MODERN DENTISTRY—THE TECHNIQUE OF CONTROL IN CLASSIFIED CASES.\*

By T. H. Terry, D. D. S., Cleveland, Ohio.

WHEN nitrous oxide was proven to be a safe, sure and rapid anesthetic for the extraction of teeth, it was indeed a banner day for dentists, and equally as great a boon to humanity in general; and the masses have not been slow to appreciate and profit by its use whenever given a chance to test its marvelous qualities. Here, unfortunately, its progress ceased. The dentist, believing that nitrous oxid had reached its height of usefulness, employed it when necessary, and the surgeon thought it a good agent in its field, though it had no place in his practice; and although the outfits were crude and cumbersome and cold gas used, it is indeed wonderful how few fatalities are charged against this anesthetic. This, no doubt, is due to the fact that the approach of the danger line is so marked that it cannot be misunderstood. Certain it is that the method employed was such that if applied to any other anesthetic agent the results would have been fatal; but the fact that anesthesia is often produced in thirty seconds and complete recovery takes place in less than five minutes, is only another reason why this gas has such a wonderful record.

\*Read before the Odontological Society of Western Pennsylvania.

The writer, before the days of pressure anesthesia and cataphoresis, used a Hurd apparatus and face inhaler for operations on the teeth, but owing to the short duration of the anesthesia the results were embarrassing. With the advent of the improved nasal inhaler, which was perfected by Dr. Charles K. Teter of Cleveland, Ohio, the introduction of a definite mixture of pure oxygen gases by an apparatus that produces and maintains positive pressure, either slight or great, as the nature of the case demands; and the advantage of administering the gases warm, heretofore impossible operations became every-day occurrences. These advantages make it possible to produce and maintain prolonged anesthesia of two or more hours' duration, if necessary.

The method of extracting was at that moment changed from a hurried, haphazard operation to a careful and scientific one. Then new and wonderful possibilities in the realm of analgesia were evident, but the lack of all data or information of any kind on this subject led the writer into a series of experiments and now, after an experience of over two thousand administrations in his own private practice, he feels confident in saying that when the right technique is employed its possibilities are unlimited. Let us get down deep into the facts of its use.

For the purpose of bringing the subject before you in an intelligent and concise manner, I have grouped all patients into four classes, namely, A, B, C and D, which I think clearly represent our cosmopolitan practice.

#### CLASS A

This is the ordinary and greater percentage of patients who present themselves for our service. They have faith in your not hurting them and take the chair willingly. You instruct them to breathe naturally through the nose and, when they feel sleepy, not to resist. The nitrous oxid bag is comfortably filled with gas, the oxygen valve is set at 2 per cent, the warmer having been previously lighted, the mouth prop adjusted and the inhaler placed carefully over the nose so as not to obstruct the breathing. The air valve is now closed because the amount of air in the lungs is sufficient to satisfy them. As soon as the bag is emptied the air valve is open half way and the smallest possible stream of nitrous oxid is allowed to flow continuously, care being taken to preserve an even pressure at all times. In nearly every case the patient is ready as soon as the first bag of nitrous oxid is exhausted. Evidence of readiness is a slight increase in the length of respiration, perspiration slight or marked, as the case may be, and often a general fixation of the muscles. If there is any resistance to the burr when you begin to operate, cut down the air and increase the flow of gas about one-third. If, on the other hand, there is no resistance and the breathing becomes labored with signs of cyanosis, increase the quantity of oxygen one-half, when the color will be restored and breathing corrected almost instantly. In this condition the patient is tranquil and any ordinary operation can be completed.



## CLASS B

As previously stated, not having any data on the subject of analgesia, it took me some time before I could understand the patients I have grouped under Class B. These patients are lazy or indifferent breathers. Your instructions to breathe deeply amount to nothing. After the first few inhalations the patient passes into a quiet half sleep, where the breathing is so slight that it is hardly in evidence. This must not be mistaken for analgesia, however, which can be readily proven by any attempt to operate in this stage for discomfort is apparent at once. This condition will continue as long as the patient receives enough oxygen or air to perfectly satisfy the lungs. To compel this patient to breathe properly, close the air valve, have the oxygen valve set at about 2 per cent and increase the nitrous oxid until pressure is noticed by a sharp intake of the breath. In some cases, at this point, the patient will start to breathe through the mouth, but this can be remedied at once by placing the rubber bowl over the mouth for a few seconds, when the patient will resume the nasal breathing and the operation can continue.

## CLASS C

Under this class is grouped the extremely apprehensive, neurotic and hysterical individuals. This class represents the spasmodic or irregular breather, and in the first and often in the second stage of analgesia, to touch the teeth with an instrument will be resented instantly. The brain of a patient of this class is so charged with fear that as long as it is capable of recognizing sensation this resistance will continue, and any operative work would therefore be impossible. The moment you discover your patient to be one of this class, cut out all air, add about 4 per cent of oxygen and double your gas flow and keep it there. When breathing becomes slightly labored, tap the teeth with an instrument and if there is no resistance to sound you may begin to operate and continue as long as necessary. This is by far the most difficult class that daily come to your office to handle, and complete control must be maintained. Moaning, laughter or tears are due at any time, though not the slightest pain is felt. Confidence is gained as apprehension diminishes and the patient becomes less and less hard to control.

## CLASS D

I wish I could stop here and forget class four, but it cannot be, for the truth will out and the alcoholics and drug users who come under this class are a problem indeed. The amount of gas used when dealing with this class is double and often treble the quantity used in the other cases. The object of the operation is to pass through the analgesic stage and into the second stage of anesthesia as soon as possible; force is used in the gas flow as soon as deep breathing is established; air is entirely excluded and the oxygen usually cut down between 2 per cent and 3 per cent; the patient

takes on a slightly dusky hue and this is maintained while the operation lasts. Although this evidence of cyanosis is not ordinarily desirable, it is necessary with this class of patients if they are to be kept manageable. I am glad to report that this class forms a small percentage of our practice, and the technique of the administration is not difficult if we realize that the shortest road to anesthesia brings success.

#### WARM GASES

The advantages of using warm gases are many; the temperature, being conducive to quick absorption, the patient passes into the operative stage much quicker than when the gases are cold and irritating to the bronchi and lungs.

The amount of gas used is from one-fourth to one-third less, which is an item worth considering to the dentist who uses it as often as he should. A temperature of about 90°F brings the best results without causing nausea.

In taking up this work the dentist must remember that he becomes, in a way, a specialist and attracts to himself a clientele that expect very different service than that rendered by the average practitioner. Here the law of compensation steps in. The advance in fees, lessening of the nervous strain and satisfied and appreciative patients are all the results of this method.

There are great changes being made in the anesthetic world every day by substituting nitrous oxid and oxygen for ether and chloroform. Every leading hospital in the country is seriously considering adding this anesthetic to its equipment; many of them, as you know, have already done so.

The safety of the anesthetic so enlarges the operative field that cases which the surgeon has heretofore refused to consider with any other agent as an anesthetic he now deems good risks with the use of this mixture.

In conclusion, then, the field of nitrous oxid and oxygen in dentistry is, first, to operate on the teeth without causing pain, the stage of analgesia or anesthesia depending on the patient; second, to free the patient from all dental noises and nervous strain; third, to allow the dentist to do his work well without fear of inflicting pain and to do the work in one-third of the time it would ordinarily require; fourth, and not least, the great lessening of the nervous strain on the dentist, making his work more pleasant, more appreciative and simplifying every operation.

Now, if I have succeeded in making plain the procedure in some difficult case, or by this classification helped you to solve the problem of control of the patient, the purpose of this paper has been reached.

#### DISCUSSION

JOSEPH N. KATZ: Not only have I read the paper of Dr. Terry's, but have diligently studied it so as to be enabled to intelligently discuss same, but am exceedingly sorry to say that I find very little to be refuted or contradicted; at least I am unable to do so. I have sought for flaws and faults but failed to find any. The only fault I find with the paper is its greatest virtue, viz., its brevity. Many men have presented this subject not only here but before other societies, and invariably these men begin by

lauding the great virtues of nitrous oxid and oxygen, but stop right there. Our essayist, on the other hand, is content to give us just the very thing that so many fail to give, namely, the proper technique for its administration, and for this many thanks. Dr. Terry is very unassuming in his position regarding this agent. He knows its admirable qualities and takes it for granted that everyone else knows them, and hence is satisfied to give its working details only.

It is my belief that this paper will prove a valuable contribution to the literature of nitrous oxid and oxygen, especially as regards technique. Our text books on nitrous oxid are barren as to the manipulation thereof in operative work. Teter, of Cleveland, who has written extensively upon the subject, is an extracting "specialist," and whatever direction is furnished in his "book of instructions" as to the manipulation of his apparatus, is gathered from the experience of others. DeFord, of Iowa, whose admirable work on "General Anesthetics in Dentistry" is quite complete, and while he treats of this subject quite authoritatively, is nevertheless a "Somnoform" enthusiast himself, therefore I say again that this paper will be of material benefit to him who seeks for the technique of nitrous oxid and oxygen in operative work.

As previously stated, I find very little that I can take issue with the essayist, save perhaps in a few minor details. At the outset of the paper Dr. Terry says "that the masses have not been slow to appreciate and profit by its use." I am very glad that he thinks so. I have no statistics at hand to show the exact figures of the manufacture and sale of nitrous oxid in this country, but I venture to say, that in proportion to the number of dentists practicing, the quantity used must be small indeed. How can the "masses" appreciate this anesthetic, when the masses in the dental profession fail to appreciate its benefits? Look what Dr. DeFord says: "In all other departments, dentistry has made wonderful progress, outstripping almost every other profession in the matter of advancement; yet, in this particular branch, anesthetics, which should have, by right of discovery and inheritance, excelled all other specialties of medicine, the dentist has been a laggard and a coward." My experience with the masses, and by the masses I mean the common people, those that "the Lord must have loved most, for He made so many of them," has been quite the contrary; they would rather "bear the ills that flesh is heir to than fly to others that they know not of," and no doubt but what it is due to the fact that in the matter of anesthesia we have been what Dr. DeFord calls us, "laggards and cowards."

I admire very much Dr. Terry's way of labeling patients. He divides them into four classes—A, B, C and D. He tells us that Class A is the ordinary and greater percentage of patients who present themselves for our services, and that they have faith in our not hurting them and take the chair willingly. Perhaps Class A predominates in Cleveland; here in Pittsburg this class has great faith in our hurting them, and do not take the chair quite so willingly. I believe that what Dr. Gregg told the New York Odontological Society and this society holds good anywhere. Says he: "People come to our office and say, 'Doctor, I have put off this visit as long as possible. I would rather do anything than go to the dentist. I can easily endure the pain of a surgical operation, but I cannot bear the shock of having my teeth filled.'"

After what you heard, you will no doubt agree with me that it is extremely difficult to discuss this paper in all of its phases, for it deals solely with technique, and while my experience with nitrous oxid and oxygen has not been as extensive as Dr. Terry's, nevertheless what little experience I have had in its administration in operative work has been very successful, I can recall only one case since last July that was an utter failure, but then he must have belonged to Class D, but I did not know the classification at that time, but henceforth each patient shall bear his proper label. I always use warm gases. In operative work I use very little oxygen, as I instruct my patients to occasionally breathe through their mouths and it serves the purpose very well. Of course, should my patient show any signs of cyanosis, the oxygen is there to remove same. Dr. Terry mentions that by the use of nitrous oxid and oxygen we lessen our nerve strain,



and in conjunction with this statement I desire to say that Dr. A. O. Ross, of Columbus, Ohio, in his address as president of the Ohio State Dental Society, selected for his subject "The Most Frequent Causes of Mortality Among Dentists, Compared With Other Professions, and Probable Means of Prevention," and therein he shows that the dentist is not subject to "tuberculosis," nor to "Bright's disease," but chiefly to heart failure. Says Dr. Ross: "But as dentistry . . . became more exacting and the dentist was also taken up more in social affairs, will account largely for the high, nervous tension and is a probable cause for much of the heart trouble. Some one might ask why the surgeon doesn't have a higher rate than the dentist. The condition of the patient being operated upon would have much to do with the nervous tension. The surgeon, having his patient under an anesthetic, he works as though the patient were dead. Not so with the dentist. His patient is constantly wriggling and cringing under the pain and he must be kept on a constant tension because of this wiggly patient for whom he is working, and the nervous strain is so great that it is exhausting, and exhaustion of the nervous system means exhaustion of every part of the body, including the heart." I merely mention this to prove that by the use of nitrous oxid and oxygen we may cut down the death rate of ourselves as well as our clientele.

In conclusion, I wish to pay a personal tribute to Dr. Terry; to him I am indebted for what little success I have had with nitrous oxid and oxygen; when I heard Dr. Gregg tell us, two years ago, that without this agent he would rather quit the practice of dentistry, I became so imbued with that spirit that I procured a Teter outfit and timidly began using it as per directions furnished with the outfit plus what DeFord tells us in his book on "Anesthesia," but I was doomed to failure and my outfit was likewise doomed to go either to the "junk-shop" or some other place, but fortune threw me in the road of Dr. Terry. While at the meeting at Cleveland I had the pleasure of meeting him personally and he demonstrated to me the way to use it, and my troubles ended there and then. I thank him and you.

## COMBINATION FILLINGS OF CAST GOLD AND PORCELAIN OR SILICATE CEMENTS.\*

By Dr. C. H. Neill, Fairmont, W. Va.

This is a method of using cast gold inlays in conjunction with low-fusing porcelain and silicate cements.

In the large approximal incisor cavities in the anterior teeth, to replace the ordinary contoured filling or contoured inlay, I prepare the wax model in the usual manner and remove the labial aspect of it; prepare in the labial aspect a box-shaped cavity, cast inlay, cement into position, and start a new operation on the labial cavity prepared in the inlay. That gives us the same strength of a gold inlay without the labial aspect of gold. If artificial enamel is used the incisal edges can be well protected. If low-fusing porcelain is used as a veneer there need be no gold showing at all.

\*Clinic at West Virginia State Dental Society.

**Success doesn't "happen." It is organized, preempted, captured by concentrated common-sense.**

—Frances E. Willard.

## THE PHYSIOLOGICAL AND PATHOLOGICAL RELATION BETWEEN THE NOSE AND MAXILLARY SINUS

By Homer Dupuy, A. M., M. D., Oto-Laryngologist—Charity  
Hospital, New Orleans

**M**Y PRESENCE here means that you are naturally interested in a subject which has long proved a bone of contention between the dentist and rhinologist. I am delighted, however, to extend the olive branch of peace to this distinguished body, for by surgical conquests the maxillary sinus is rapidly passing over to the field of rhinology.

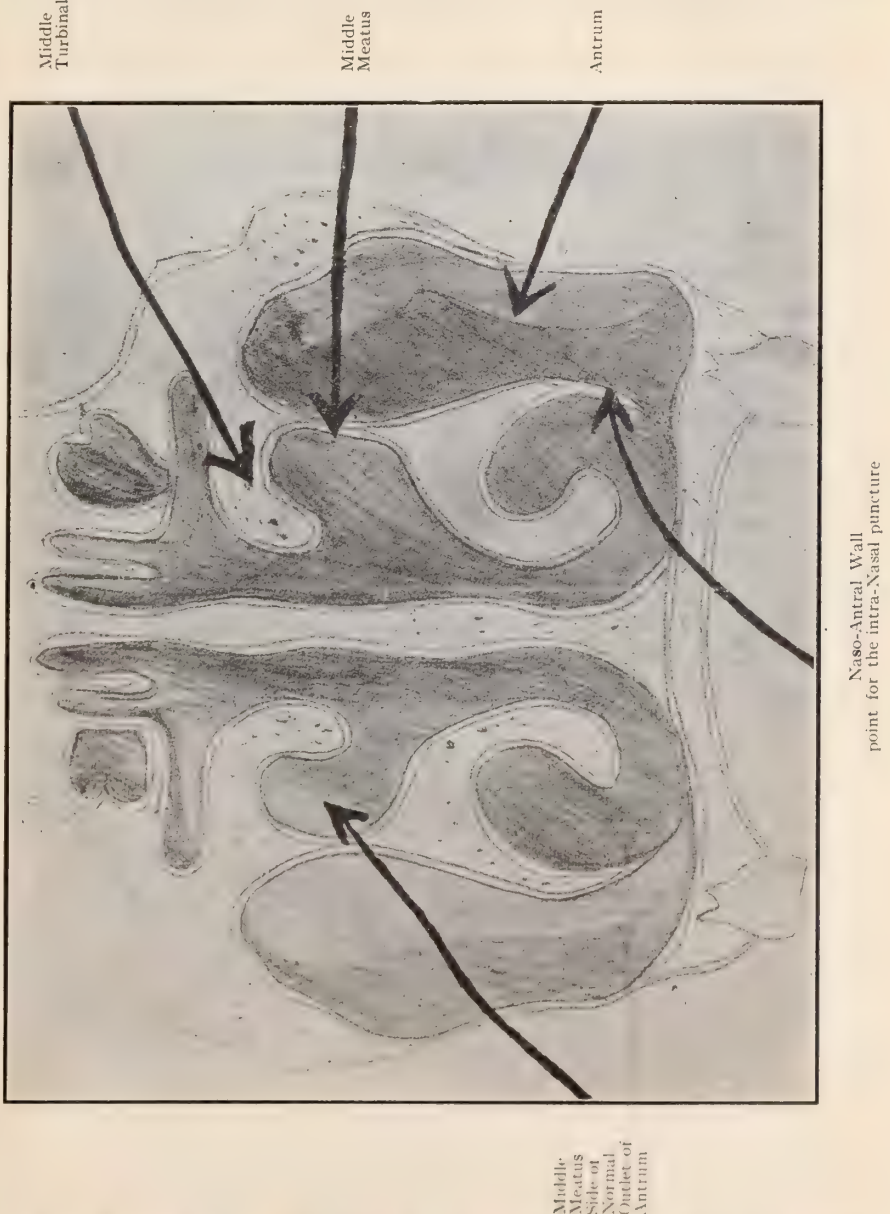
The more recent anatomical and clinical investigations have established that all the nasal sinuses are accessory cavities of the nose. The maxillary sinus is, therefore, an appendage of the nose, so that between these two parts there is continuity and contiguity of structure. The sinuses assist the nose in its all important function of (1) heating, (2) moistening, (3) filtering the incoming currents of air. Enormous blood supply goes to the nose to carry on this work. The air before it reaches the post-nasal space is approximated to the body temperature, 98 degrees. The maxillary sinus, with its enormous area of mucous membranes, containing numerous mucous glands, is the most severely taxed of all the sinuses in giving heat and moisture to the inspired air. Its increased functional activity must certainly predispose it to disease, when contiguous structures become affected.

Which sinus is the most frequently involved is still a mooted question. The great amount of heat and moisture given off by the mucous lining is greatly reduced when this sinus becomes the seat of disease, and thus the inspired air loses in purity. This deterioration in quality has ulterior ill effects on the human economy.

\* \* \* Anatomical variation in the architecture of the sinus itself and of contiguous structures largely determine its vulnerability to infection from the nasal side. The normal outlet of the sinus empties into the middle meatus. This position of the outlet—the floor of the sinus—is unfavorable for irrigation, and this feature in itself predisposes to retention of secretions within the cavity. The presence of several accessory outlets near the one normal outlet is fairly constant and may relieve the situation when the sinus is filled with secretions. This normal outlet was once utilized for catheterizations in the hope of relieving pus accumulations. The procedure is painful, extremely difficult of performance, and surgically inefficient. It is crude and deserves to be completely abandoned as a point of entrance to the sinus. The lower the floor of the sinus, more favorable are the mechanical conditions towards retention of secretions; on the other hand, a floor not far removed from the outlet favors natural irrigation from the sinus. There is constant variation as to the position of this floor. In the light of our recent surgical advances a low floor, one on

a plane with the floor of the nose, presents favorable features for the intra-nasal puncture of the naso-antral wall, as by this procedure we *secure drainage at the lowest level of the antral floor through the nasal cavity.*

The natural drainage of the maxillary, frontal and ethmoidal sinuses



is in the middle meatus. Here is the common meeting point. Whether or not the secretions from any one sinus be healthy or pathologic, the middle meatus is the common outlet. Pus in this region may, therefore, infect other sinuses. This outcome will largely depend on the conforma-



tion—position—and general arrangement of the parts around the middle meatus. This applies in a particular way to the *middle turbinated bone*—its size, its position, whether it infringes on the meatus so as to interfere with natural drainage—whether its undue enlargement interferes with the outflow of secretions from the various sinuses. We have in the middle turbinated bone one of the keys to the situation, should the bone, as it often does, interfere with the drainage of these parts, we readily see how pus from a sinus, not finding a free outlet, will back up into some other sinus, with an infection of it as an end-result. Thus the frontal sinus secretions may drain into the maxillary sinus infecting it—the maxillary may in turn cause extension of the trouble into the ethmoidal sinus. And we have thus a *vicious circle*, all arising from the deficient drainage induced primarily by an enlarged or by an unfavorably situated turbinated bone, or by some other bony defect in the region of the middle meatus. The presence of polypi may also interfere with the drainage of this area.

That portion of the naso-antral wall lying under the inferior turbinated bone is an anatomical point of extreme importance in the more modern surgery of the antrum. It is along this area that we puncture the naso-antral wall to gain entrance into the sinus for purposes of irrigation in the subacute, and even in some of the chronic affections of this cavity. On radical operations about the antrum for the cure of long-standing suppurations, after closing the buccal wound, through which curettage of the antrum has been practiced, we break down a portion of this wall for the future post operative intra-nasal irrigations. It is quite evident that draining the sinus from this low point into the part normally related to it, the nasal cavity, presents many advantages over the alveolar route.

\* \* \* Continuity of parts between the nasal cavity and antrum is made all the more intimate when we note (1) that embryologically the nasal sinuses are off-shoots from the original nasal sacculus, (2) the nasal mucous membrane, with some slight attenuation, lines the sinus walls. We have here a natural arrangement for the extension of disease from the nose into any particular sinus, or from the sinus into the nasal cavity itself, or from one sinus into the other. It is approximating the true percentage to state that sinus troubles account for 60 per cent of nasal diseases. When we consider the prevalence of grippe and its predilection for the nasal accessory cavities, it is not difficult to explain the enormous increase in sinus affections since the advent of grippe. The interrelation between these cavities and any obstruction to natural drainage will certainly promote the extension of disease from one sinus to the other; the antrum bears no special immunity to this invasion. Such diseases as Scarlet Fever, Measles and Diphtheria seldom fail to involve the nasal cavity, leaving more or less some pathological impress on these parts: this may lead to permanent alteration in the nose and to changes in one or more of its accessory cavities.

# EDITORIAL

We take pleasure in welcoming our old friend, Dr. Bernard J. Cigrand, Batavia, Ill., to a seat on the editorial tripod.

He writes that he has purchased the *American Dental Journal* and expects to conduct it as an independent journal, free from all "entangling alliances" with trade or other interests, under the following declaration of principles:

- "Devoted to advancing the art and science of dentistry;
- "Arousing a deeper conception of our duty to the public;
- "Instilling a broader and more liberal professional spirit;
- "Aiding in elevating the plane of dental organization;
- "Supporting the State Boards in executing dental laws;
- "Lending assistance to worthy and ethical practitioners;
- "Instituting library and college extension course;
- "Pointing the way to entertainment, recreation and rest;
- "Instructing in the science of proper practice building;
- "Teaching the public the art of dental hygiene."

"These be brave words, my brethren," and THE DENTAL SUMMARY wishes Dr. Cigrand and his enterprise most hearty Godspeed.

## KEEP YOUR GRIT

*Hang on! Cling on! No matter what they say.  
Rush on! Sing on! Things will come your way.  
Sitting down and whining never helps a bit—  
Best way to get there is by keeping up your grit.*

*Don't give up hoping when the ship goes down,  
Grab a spar or something—just refuse to drown,  
Don't think you're dying just because you're hit,  
Smile in face of danger and hang on to your grit.*

*Folks die too easy—they sort of fade away;  
Make a little error, and give up in dismay.  
Kind of man that's needed is the man with ready wit,  
To laugh at pain and trouble and keep up his grit.*

# SOCIETY ANNOUNCEMENTS

**NATIONAL DENTAL ASSOCIATION, Washington, D. C.**

**September 10th to 13th, 1912**

## OPENING SESSION.

The Association will be called to order at 10:00 A. M., September 10th, in the convention hall of the New Willard Hotel (headquarters).

Invocation—Rt. Rev. Alfred Harding, Washington, D. C.

Address of Welcome—Hon. Cuno H. Rudolph, Washington, D. C.

Response to Address of Welcome—Frank O. Hetrick, Ottawa, Kansas.

President's Address—Arthur R. Melendy, Knoxville, Tenn.

Modern Dentistry in Germany—Newell S. Jenkins, Dresden, Germany.

## PROGRAM FOR GENERAL SESSIONS AND SECTIONS.

- |  |                   |
|--|-------------------|
| L. F. Kebler (M. D.)   | Washington, D. C. |
| Oral Dental Preparations.  |                   |
| F. E. Stewart (M. D.)  | Philadelphia, Pa. |
| Standardization of Materia Medica.   |                   |
| M. C. Smith  | Lynn, Mass.       |
| What the Government is Doing to Prevent Diseases.                                    |                   |
| William O. Hulick  | Cincinnati, Ohio  |
| Crown and Bridge Work.   |                   |
| J. V. Konzett  | Dubuque, Iowa     |
| Something about Cavity Preparations for the Gold Inlay.                              |                   |
| Leon S. Medalia (M. D.)  | Boston, Mass.     |
| Pyorrhea Alveolaris, its Causes and Treatment with Vaccine.                          |                   |
| George B. Harris   | Detroit, Mich.    |
| Pyorrhea: its Treatment by Bacterial Vaccines and Results of Animal Experimentation. |                   |
| C. M. McCauley   | Abilene, Texas    |
| The Great Need of Improvement in Quality of Commercial Alloys.                       |                   |
| B. Holly Smith   | Baltimore, Md.    |
| Aristocracy in Dentistry—Do We Need It?  |                   |
| W. A. Lovett   | Birmingham, Ala.  |
| In Hoc Signo Vinces.   |                   |
| H. H. Johnson  | Macon, Ga.        |
| Other Methods of Making Gold Inlays.   |                   |
| W. R. Clack  | Mason City, Iowa  |
| Extension for Prevention vs. Pinhead Cavities.                                       |                   |
| Joseph Head  | Philadelphia, Pa. |
| Intimidation of Dentists and Dental Societies.                                       |                   |
| J. J. Moffitt  | Harrisburg, Pa.   |
| The Treatment and Filling of Root Canals.  |                   |



- M. L. Rhein.....New York City  
Oral Sepsis and a Consideration of its Systemic Effects.
- J. F. Biddle.....Allegheny, Pa.  
Diagnosis and Treatment of the Important Destructive Diseases of  
the Dental Pulp.
- Thomas B. Hartzell.....Minneapolis, Minn.  
Post-Operative Treatment of Pyorrhea Alveolaris.  
(Illustrated by Stereopticon.)
- Harvey W. Wiley (M. D.).....Washington, D. C.  
A Consideration of the Effects that Impure Foods and Adulterated  
Drugs have upon the Human System.
- George E. Hunt.....Indianapolis, Ind.  
Teeth and Health.

(The last two subjects to be given as lectures at the Wednesday evening session.)

A Preliminary Program was mailed to our members, essayists and clinicians August 3rd. In addition to above literary program, this contained 270 clinics and a number of additional ones will be incorporated in the Official Program.

#### RAILROAD RATES

The Trunk Line and New England Passenger Associations have authorized a rate of a fare and three-fifths (3-5) within their territory, on certificate plan; 100 certificates required and a fee of 25 cents for validating same. The Southeastern Passenger Association advertises round trip rates from specific points in their territory. Summer Tourists' rates to Eastern points may be secured in Western Passenger Association territory. The Central Passenger Association refused to make any concession, but Summer Tourists' rates may apply from points in this territory.

Any local railroad agent can give jurisdiction of above Associations, as well as give full particulars regarding rates and stop-over privileges from their particular point. Inquiry should be made regarding excursion rates to points east of Washington, as such transportation with stop-over privileges may be secured to a better advantage.

The proposed plan of reorganization is not to become effective until 1913, but our present Constitution provides that any member of a State Dental Society, or affiliated society, is eligible to the National. The membership fee is \$5.00, which pays one year's dues and includes copy of Official Transactions. Application blanks may be secured from the State Society Secretaries, and must be signed by the President and Secretary, and can be mailed in advance, with fee, to H. B. McFadden, Treasurer, 3505 Hamilton street, Philadelphia, Pa., or handed to him or the credential committee at time of meeting. All reputable practitioners of dentistry are invited to attend this meeting and become actively affiliated with our Association.

HOMER C. BROWN, Recording Secretary,  
185 East State Street, Columbus, Ohio.

## NATIONAL ASSOCIATION OF DENTAL EXAMINERS

The thirtieth annual session of the National Association of Dental Examiners will be held at the New Willard Hotel, Washington, D. C., beginning Friday, Sept. 6, 1912, at 10 o'clock a. m. and continuing until adjournment.

Delegates expecting to attend are advised to make reservation early on account of the meeting of the N. A. D. E. and N. D. A.

T. A. Broadbent, Secretary,

15 E. Washington St., Chicago.

Henry L. Turner, President, St. Louis, Mo.

## OBITUARY

With profound sorrow we announce the death of Dr. Fred W. Joslin of Big Rapids, Mich., his wife and four-year-old son Howard, and the probably fatal injury of his mother, when their touring car was struck and demolished by a G. R. & I. freight train one mile north of Howard City, Mich., August 22. Another son, Burr, aged eleven, suffered a fractured leg and severe bruises.

Dr. Joslin and party left Big Rapids ten days ago for a trip through the East. They arrived in Detroit on the day of the accident by boat and left early in the day in their big touring car for their home at Big Rapids.

Dr. Joslin and his son Howard were instantly killed. The boy was hurled from the car onto the track, the train passing over his head. Dr. Joslin's wife and mother were rushed to Big Rapids in a special train, but the former died before the train reached that city.

Burr Joslin could give but few details of the accident. He says that he remembers seeing the engine a few feet away.

The freight train, it is said, was traveling at more than twenty miles an hour and the big touring car was carried nearly two blocks on the front of the engine. Dr. Joslin was pinned between the automobile and the engine. His wife was found close to her husband's body on the pilot.

It is thought that the engine of the touring car stalled at the top of the steep grade leading up to the track. At the inquest the fireman of the locomotive testified that the auto seemed to him to stop on the track, and a farmer who witnessed the accident states that the machine was standing still when struck.

The Joslin family was one of the most prominent in Big Rapids and the news of the accident plunged the city in grief. Dr. Joslin, in addition to his dental practice, owned the largest clothing store in Big Rapids. He was prominent socially and was a member of local lodges F. & A. M. and B. P. O. E. He was prominent in city affairs and a political factor in the county, although never an aspirant for office.

# NEW PUBLICATIONS

## *Illustrated Catalogues of Well-Known Publishers.*

We have received illustrated catalogues from Lea & Febiger, 706 Sansom street, Philadelphia, W. B. Saunders Co., 925 Walnut street, Philadelphia, and C. V. Mosby Medical Book and Pub. Co., St. Louis. These catalogues contain information regarding the excellent books published by these reliable publishers and can be obtained by any dentist by request to the publishers.

*The Surgery of Oral Diseases and Malformations; Their Diagnosis and Treatment.* By George Van Ingen Brown, D.D.S., M.D., C.M. Oral Surgeon to St. Mary's Hospital and to the Children's Free Hospital, Milwaukee; Professor of Oral Surgery Southern Dental College, Atlanta, Ga.; member American Medical Association, National Dental Association, Chairman of the Section on Oral Surgery of the Fourth International Dental Congress, etc. Philadelphia: Lea & Febiger, 1912. Cloth, \$6.00 net.

This book, of 740 pages, contains the best thought of a man who has had years of experience as an oral surgeon, teacher and writer.

It has been the author's purpose to include all important pathological conditions that affect or are influenced by the buccal cavity and its immediately surrounding parts; to deal thoroughly with the etiology and symptoms of these affections, and to describe the necessary operative procedures clearly and concisely with sufficient detail to give a thorough understanding of the most approved methods of treatment, the risk involved and the probable results.

The operative treatment of diseases of the nose and throat has been omitted, because this lies outside the province of oral surgery. The widening of the nares, however, by separation of the maxillae for the correction of nasal defects and the control of pathological influences that may affect the nose and associate parts through the mouth is fully illustrated and described, because such work is properly within the scope of the functions of the oral surgeon. The author says great labor has been expended in an effort to present the subject of oral surgery with sufficient broadness to cover all affections directly and indirectly related and yet to confine descriptive matter to facts that are essential to the fulfillment of the purpose of the work.

The chapters on Hare Lip and Cleft Palate represent the chief part of the author's life work. His conception of the presentation of these subjects is based upon extended observation of the confusing conditions which surround those who are called upon to treat such cases in the course of general practice. It is essential that dentists should have an understanding of oral affections, for it is well known that grave consequences might often be avoided by the early detection and correction of quite simple mouth diseases. Too commonly these cases have been allowed to advance to a state of hopelessness, or radical surgical operations have been inadvisably performed with unnecessary personal disfigurement or danger as the result. Many extra buccal affections might also be checked in their incipency if dentists who have opportunity to observe them during early stages fully recognized their significance.

In the preparation of the work the author has kept the clinical aspect constantly in view in order to provide a dependable source of information. Many original drawings have been carefully prepared to show each operative step in the correction of these deformities. Much space has been given to the explanation of operative methods and the underlying factors which influence results. The pictures of large numbers of patients are shown in order to emphasize the thoroughly practical clinical value of operations and corrective measures that are recommended. These are in the form of engravings made from photographs. All illustrations, except those credited to other writers, are representations of the author's cases; 359 engravings and 21 plates are used to illustrate the text.



*Local Anesthesia in Dentistry, with Special Reference to the Mucous and Conductive Methods.* A Concise Guide for Dentists, Surgeons and Students. By Professor Dr. Guido Fischer, Director Royal Dental Institute of the University of Marburg. Translated from the German edition by Richard H. Riethmüller, Ph.D., Dental Dept. of the Medico-Chirurgical College, Philadelphia. Philadelphia and New York: Lea & Febiger, Pub., 1912.

The author is convinced that local anesthesia, in its present perfection, is destined to supplant general anesthesia in dentistry almost entirely. He has, therefore, laid chief stress upon an exact presentation of the technic of injection, and by painstaking studies of anatomy, physiology and pharmacology involved, has succeeded in surmounting successfully the defects that, until recently, still inhered in methods of local injection of anesthetic agents. The experience reported and results obtained are presented in this volume with impartiality, yet the author's individual conviction is unhesitatingly asserted—the treatment of such an essential question as the choice of the anesthetizing agent. This will be fully appreciated by busy practitioners eager to avail themselves of a valuable, trustworthy and tried method without incurring the trouble, expense and risk of experimenting with a host of strenuously advertised proprietary preparations before arriving at a definite choice. The author advocates novocain and its solutions, which, after innumerable experiments, he has found the most suitable and safe. Various other methods of inducing local anesthesia are described. Special consideration has also been given to anesthesia in the therapy of inflammation and wounds, to adjuvant, systemic and sedative treatment, to the manipulation of nervous, debilitated or sickly patients and of children, and to local anesthesia in the extirpation of vital pulps and in obtunding hypersensitive dentin.

Like all of the books of these well-known publishers, this book is a work of art, and the numerous illustrations, many colored, add greatly to elucidation of the text.

*Physiology.* A Manual for Students and Practitioners. By A. E. Guenther, Ph.D., Professor of Physiology in the University of Nebraska, and Theodore C. Guenther, M.D., Attending Physician, Norwegian Hospital, Brooklyn, N. Y. New (2d) edition, thoroughly revised. 12mo, 269 pages, illustrated. Cloth, \$1.00 net. Lea & Febiger, Publishers, Philadelphia and New York. 1912.

This is one of the well-known Medical Epitome Series published by this enterprising firm. It was the aim of the authors in writing this work to gather, within brief compass, those facts of physiology with which medical and dental students should be familiar in order that they might successfully pursue the more advanced courses of the curriculum. It was not the intention to produce a work of originality nor an elaborate text-book, but one offering a means of quickly reviewing the essential features of the subject. Its purpose is a brief exposition of physiology suited to the needs of students and practitioners.

*Microscopy, Bacteriology and Human Parasitology.* By P. E. Archinard, A.M., M.D., Bacteriologist, Louisiana State Board of Health and City Board of Health, New Orleans. New (2d) edition, thoroughly revised. 12mo, 267 pages, with 100 engravings and 6 plates. Cloth, \$1.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1912.

This is another of the Medical Epitome Series. As a concise presentation of the essential points of Bacteriology and Microscopy this little work has won the favor of students and practitioners. In its new edition the scope has been broadened to include some of the protozoa, an improvement which should increase its usefulness to the practicing physician and to the advanced student. The features which gained for it the approbation of its readers have been continued in the present very thorough revision.

*Principles and Methods of Orthodontics.* An Introductory Study of the Art for Students and Practitioners of Dentistry. By B. E. Lischer, D.M.D., Professor of Orthodontics, Washington University Dental School; Member of the American Society of Orthodontists; Author of "Elements of Orthodontia," etc. 12mo, 258 pages, with 248 illustrations. Cloth, \$2.75 net. Lea & Febiger, Publishers, Philadelphia and New York, 1912.

Malformations of the jaws and misplacements of the teeth are so common that they come under the observation of every dentist, and from the standpoint of the patient

they are so disfiguring, and so great an interference with the functions of the mouth in eating and speaking that they demand correction. The very necessity of such cases has stimulated research and ingenuity in their behalf, and hence Orthodontics has reached a high degree of development and success. Professor Lischer is qualified to present his subject with the highest authority. His purpose in writing this manual has been to provide students and dentists with a guide to the principles and practice of Orthodontics, simply written, clear and yet full in detail. He has furnished abundant illustrations showing conditions, methods of treatment and results. The volume affords, in convenient form, a concise and practical exposition of the subject in its most advanced development.

*Dental Laws Condensed.* A Brief Guide to the Requirements of Dental Examiners from Applicants to Practice Dentistry in the United States of America and Island Possessions, Canada and the Provinces; also the leading civilized countries throughout the world. By Alphonso Irwin, D.D.S., Camden, N. J., member the Amer. Med. Asso., National Dental Asso., N. J. State Dental Society, Southern Dental Society of N. J., National Board of Examiners and N. J. State Board of Registration and Examination in Dentistry. 1912.

An urgent need is a brief statement of the requirements exacted by the various states and foreign governments for permission to practice dentistry. It has been the author's aim to supply this need in the form of a Guide, publishing only the briefest statements requisite to give the required information, quoting excerpts from laws when that appears to be sufficient, and publishing the law in full in certain cases where it has been recently enacted or for some other special reason. The author says that he does not claim that the information is complete or perfect, according to everyone's ideas on the subject, but claims that this is the first attempt to present legal dental requirements throughout the world in a systematic manner, and the information obtained is from official sources of the most reliable character and of recent date.

*Baby's Teeth to the Twelfth Year.* By Albert Westlake, D.D.S., New York. New York and London: Mitchell & Kennerley, 1912.

The author states that this brochure was written in response to an appeal from a large number of his clientele for instruction and guidance. It is a friendly talk in print rather than a didactic discourse. It aims principally to aid in the acquirement and maintenance of mouth comfort; to suggest how to lessen, by early preventive measures, the ills of both childhood and adult life, and to remove the dread of the dental chair.

*Oral Surgery.* A Text-Book on General Surgery and Medicine as Applied to Dentistry. By Stewart Leroy McCurdy, Professor of Anatomy and Oral Surgery, School of Dentistry, University of Pittsburgh; Chairman of Section on Stomatology, Amer. Med. Asso.; Orthopedic Surgeon, Presbyterian and Columbia Hospitals, Pittsburgh; author of "Manual of Orthopedic Surgery," "Anatomy in Abstract," "Emergencies in Abstract," "Arthrosteopedic Surgery." New York and London: D. Appleton & Co., Publishers, 1912.

This is another excellent treatise on oral surgery by a man who has had years of experience as an oral surgeon, teacher and writer. The work comprises 469 pages, and is profusely illustrated. It is divided into two parts, the first part including the principles of general medicine and surgery, intended for the junior student, and the second part, for the senior student, including oral surgery proper. The author says his aim has been to eliminate everything that cannot be directly associated with the practice of dentistry or be of special interest to the dental student and practitioner. Dental pathology does not differ from general pathology, and the student who has been trained in the principles in general is better prepared to appreciate the pathological changes as they appear in the mouth. While this work is one of a series of text books planned by the Commission on Text-Books of the Institute of Dental Pedagogics, it is none the less valuable for the general practitioner.

# NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

## WHAT IS DOING IN THE SOCIETIES

### THE OHIO STATE

The Ohio State Dental Society, which usually meets in Columbus, will hold its next annual meeting at the Hotel Sinton, Cincinnati, Ohio, December 3, 4 and 5, 1912. A big meeting is already assured.

F. R. CHAPMAN, *Sec'y.*,  
305 Schultz Bldg., Columbus, O.

### DR. MEEKER HONORED

#### Peace Restored in the New Jersey State Society

Cape May, N. J., July 19.—All of the business of the annual outing of the New Jersey Dental Society was closed up this morning and the afternoon and night sessions were dispensed with. A resolution was passed unanimously, withdrawing pending litigation arising out of the disputes in connection with the election of officers last year and the session closed with a united and perfectly harmonious body.

In the election of officers for the new year there was but one ticket offered and this was promptly elected as follows: President, W. L. Thompson, Asbury Park; vice president, William H. Gelston, Camden; treasurer, Charles F. Jones, Elizabeth; secretary, Edward W. Harlan, Jersey City; executive committee, Walter F. Barry, Henry Fowler, C. B. Tuttle and James E. Wolverquen; membership committee, Horace I. Deemer, A. S. Burton, Franklin Rightmire, J. F. Crandall and Joseph Kussey; members of the State Board of Registration and Examination, for four years, W. E. Truex; for five years, Vernon D. Rood.

Among the papers read and discussed were two by Ohio men—Dr. George H. Wilson, on Prosthetic Dentistry, and Dr. H. L. Ambler, on Around the World Dentistry. Both are well-known Cleveland dentists.

At the close of last night's session a dinner held by the "Old Guard" was broken up by the insurgents, who took a

room adjoining the banquet hall and sang funny songs until the "Old Guard" became disgusted and abandoned the feast.

Dr. Charles A. Meeker of Newark, for thirty-six years secretary of the society, who declared some time ago that he would not be a candidate for re-election to that office, read his valedictory today, which was in part reminiscent of the early history of the organization. Dr. Meeker expressed the hope that his successor "will find the path much smoother than mine has been; that the society will grow and expand into more usefulness; that this year all differences now existing will be healed; and the society continue for years in perfect harmony."

Dr. Meeker, in beginning his valedictory, said that the society was organized October 28, 1870. Twenty-eight dentists signed the original call and all but six of these have died. The only charter member who is still active in the association is Dr. Charles S. Stockton of Newark, who, Dr. Meeker said, was unable to attend the annual meeting, being kept at home by illness.

"I well remember during the early years of our society the National Association and other societies thought it beneath the dignity of a society to have clinics and exhibits. The New Jersey State Society was the first to make public exhibits and give clinics. The wisdom of such a post-graduate course for the busy dentist has been fully demonstrated by the latter-day programs of State societies and the National Association. New Jersey has been the pioneer progressive State in many innovations. It was the first State to bring forth a resolution for a world's fair exhibit at Chicago. The exhibit was a success, but our society was basely deprived of the credit for the work performed. This society is also the first to create a fund for its indigent members who have been unfortunate in securing means for old age. Even this credit has been claimed by the national, and you do not hear any of the journals commending us except the Dental Scrap Book."

Dr. Meeker declared that New Jersey was the first of the States to have passed a law providing that incorporated dental



# THE DENTAL SUMMARY

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The Kentucky State Dental Society  
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## THE CARE OF THE MOUTH OF THE SICK.\*

By William Cummings Fisher, D.D.S., New York

THAT THE MOUTH of the sick does not receive the attention that it should is, I think, a fact sufficiently well established not to need further proof submitted at this time. Any one of you stomatologists can, I am sure, cite case after case from your own private practices, in which your patients have presented themselves to your observation, after a prolonged illness, their teeth showing signs of rapid decay due to a period of the neglect of mouth hygiene.

I am sure that much evidence of the general neglect of the mouth of the helplessly ill has come to the notice of the dental surgeons attached to hospitals, and especially those larger institutions with public or general

\*Read in the Section on Stomatology, Amer. Med. Assn., of which THE DENTAL SUMMARY is the representative organ for the dental profession, by special arrangement with the Jour. Amer. Med. Assn.

wards. Any adverse criticism, therefore, that I may make of this condition must be assumed by the members of the dental profession as well as the medical.

That some feeble effort is made at times, in some cases, toward the maintenance of a clean and hygienic condition of the oral cavity, any one is willing to admit; but a feeble effort—and in a few cases—is admission that hygienic condition of the mouth is essential. Then are we all the more remiss in our duty toward the helpless sick and invalid, if we do not perform this duty fully.

Would a nurse for one moment shirk her duty regarding the administration of medicaments? Would she fail to bathe her fever patient? Would she neglect the stool? Emphatically, no. Then why has she not been more carefully instructed in the care of the mouth and the cleaning, by use of brush and mop, of the teeth; and being carefully instructed, why has not the physician seen to it that this work was as carefully done as any other? The condition of a patient's mouth should be the meter by which is registered the ability of a nurse.

You may say the facilities in our large hospitals are not adequate and that the nurse already has much to do. Both objections—and I have heard them both many times—should be dismissed with the answer that proper facilities should be provided.

Regarding the facilities, they are very good already in most well-equipped hospitals. A tongue-scraper made of ivory or steel, which could be sterilized, together with a cotton swab, could do in such severe illness where the vigorous use of a brush would be ill-advised.

But it should be emphasized that nothing can better take the place of the thorough brushing of the teeth and the massaging effects which this has on the tissues. For it is during prolonged illness, when the patient is unable to use the teeth in mastication of hard substances, that offensive masses of mucus form on the gingival borders of the teeth, encouraging the deposition of other salivary deposits and thus set up a highly inflammatory condition of the mucous membrane, which, while the patient is in a debilitated condition, has lost its tone and is susceptible to any irritation.

In addition to the usual brushing or swabbing of the teeth, it is very essential for the hygiene of the mouth and the general comfort of the patient that the mouth and throat be sprayed with a pleasant and efficient wash or mouth-bath. To get the best results, it is essential that the spray be driven by a greater force than can be obtained by any ordinary hand atomizer. By the use of compressed air of between 10 and 12 pounds' pressure, the medicament can be driven into every little fold of mucous membrane and between the interdental spaces. To obtain the bedside use of compressed air for this purpose, I have suggested mounting on a rubber-tired wheeled platform a 2-foot air tank and automobile pump, with a 6- or 8-foot hose attachment for spray bottles.

This tank can be filled by some attendant, while the whole apparatus is in another room or hall, if there be any objections to the sound of pumping. Enough air can be stored by sixty seconds' pumping to spray the mouths of ten to fifteen patients. I have one which I used before I installed a motor power pump, which the children used to delight in pumping. I state this simply to show with what ease it can be operated and that it would be no hardship on any nurse. The platform, tank and all, could be rolled from bed to bed and thus facilitate greatly this question of mouth hygiene in the large wards.

Now, an additional word regarding the care of children's teeth—and this will also apply in many adult cases. You will find sick children who, although not dangerously ill and weak, will resent very often any marked attempt at mouth hygiene and especially the brushing of teeth. In such cases I offer a bribe in the form of chewing gum, for a half hour a day, if they will have their teeth brushed just a little. In that way I gain two things: the child permits some brushing of the teeth and by this together with the cleansing action of the gum-chewing, a rather clean set of teeth are obtained. In this manner children can be brought through a long illness without the usual decay of their deciduous teeth, often preventing that most pitiable of conditions, namely, the aching or abscessing of teeth during convalescence. The gum, after use, is destroyed by burning, a new piece being used each time.

The direct and exciting cause of tooth-decay is the lodgment of particles of food between and on the teeth, and the fermentation of this food with the productions of bacteria and acids, which destroy tooth substances. The foods that undergo this fermentation are chiefly the carbohydrates, starches and sugars—just the character of food which a convalescent is likely to receive. This decomposition and fermentation begin very quickly, so that the nurse's attention to the mouth of the sick should be directed immediately after the patient has partaken of any food.

In the Department of Therapeutics about a year or so ago, *The Journal*, in speaking on mouth hygiene and its applications in the cases of the sick, advocated the use of hydrogen peroxid on swabs when ulcerations were noticed on mucous membranes. I desire to take exception to this for two reasons: First, it is very unpleasant to most patients and adds to the already unpleasant condition of the mouth; second, by its effervescence, it can readily cause an extension of the ulceration. These conditions, if they will not heal under an application of the usual solution of iodine, aconite and chloroform, should be treated with a caustic, touched with silver nitrate, and their growth and sensitiveness thus checked.

The use of hydrogen peroxid should be discouraged; for, if any pyorrheal pockets are present which contain pus, the effervescent action of hydrogen peroxid may cause a tearing of tissue and an extension of pocket. Slight ulcerations could be treated with a solution of boric acid and glycerin.



Where nasal obstructions cause the invalid to breathe constantly through the mouth, the dry condition which is found should be relieved by frequently moistening the mucous membranes with a solution of glycerin and water, to which a drop or two of oil of betula may be added. If patient is conscious, salivary stimulation may be obtained by the use of ordinary ginger ale as a mouth-wash.

It is a question in my mind whether illness is not very often prolonged or convalescence greatly checked by an unhealthy condition of the oral cavity. I could relate several cases in my own practice in which the placing in a healthy condition of the oral cavity hastened, if it did not altogether account for, convalescence. I would rather quote from another's practice a case published recently in one of our journals:

The dental surgeon was called in this case to do what was absolutely necessary to relieve the discomfort of the patient who had been confined to her bed for three months with intestinal infection. While placing two cement fillings, the operator noticed a congested condition of the mucous membrane and on pressure, pus was seen to exude from the gingival margins. To be brief, after three or four days of treatment and the use of a mouth-bath every half hour or so, this patient was able to leave her bed and take her meals with her family; her improvement from that time on was steady and rapid.

There is no doubt that such cases as these are not only helped, but cured by the institution of oral cleanliness. Is it then necessary for me to urge further the establishment of some degree of treatment and care of the oral cavity of the sick and invalid?

373 Fifth Avenue.

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#### ABSTRACT OF DISCUSSION

DR. VIRGIL LOEB, St. Louis: I think the blame in regard to the care of the mouths of patients in hospitals may be laid on the staff of these hospitals, especially the private ones. In my own city there are very few hospitals which have stomatologists on their staff and just as few whose lectures to nurses include lectures on the care of the mouth.

DR. A. J. FLANAGAN, Springfield, Mass.: One great need that I have in mind is the question of the forceful use of a spray that has some pressure back of it. In the hospital at Springfield, with which I have been associated for some years, there is no compressed air apparatus, and in the cases that I have had charge of I have used the oxygen tank. Of course, that is an expensive method of spraying the mouth but a very efficient one. Dr. Fisher has put forth an idea today which is original and most practical—the bicycle pump to get the proper pressure. We had a case in our hospital of three months' duration in which the expense of the oxygen used amounted to about \$30, but it happened to be the case of a patient with plenty of money and we used plenty of oxygen. On the other hand, with patients from whom the hospitals do not receive a great deal of income, and some who are practically charitable patients, they are a little careful about using oxygen. If dentistry is a part of the healing art why is it not possible for those who have a hand in the arrangement of these lectures to arrange to have at least one delivered to the nurses with regard to the care of the mouth in relation to health and disease? For years the hospitals at Springfield have had an

annual lecture given by some dentist to the class of nurses on that subject. This is a practical point, and I think if we do not call the attention of the people interested in these things to it, and if we do not occasionally insist on it, we will accomplish very little.

DR. THOMAS L. GILMER, Chicago: It seems to me that the most important point to be considered is the teaching of the nurses in the hospitals, on account, not of the work in the hospitals but of the work with out-patients. In the hospital in Chicago, with which I have been connected for nearly twenty years, there has been a course of lectures to nurses, and they have been instructed in the care of the patients' mouths during illness. It is not necessary to have an expensive apparatus for the purpose of cleansing the mouth; that is impracticable in the case of out-patients. I recommend for patients' use, especially those who have fracture of jaw and are wearing appliances, a bulb syringe with numerous openings on the side of the point by which the solution of water or whatever is used may be forced in between the teeth. The teeth can be very thoroughly cleansed in that way. It does not, of course, give as much pressure, and does not, perhaps, dislodge the debris to the extent that we might with compressed air, but it answers the purpose and is more practical for out-patients. I think that cotton is a poor thing with which to cleanse the teeth. It may be all right for cleansing the mucous membrane, but it simply forces the particles of food between the teeth and into the interproximal spaces where it will do more harm than good. I do not see why any ordinary soft brush will not answer in these places and on the tongue instead of a scraper, because we do not get between the papillæ with a scraper as we do with a soft brush. Every person should cleanse the tongue once a day, and certainly a sick patient should have the tongue cleansed once a day.

DR. W. J. LEDERER, New York: The institution with which I am connected, the German Hospital of New York, has had for the past four or five years in the curriculum of the training school for nurses a series of lectures on the care of the mouth and teeth. There is another side to the care of the patient—the surgical care. The patient who is to be operated on for some intestinal trouble is carefully prepared, the surgeon sterilizes himself, his assistants and the nurses, and the patient's skin is sterilized, and yet nothing is done to the mouth, as a rule. Imagine a patient on whom such an operation is performed, with whom every precaution is taken and who yet is permitted to swallow pus by the teaspoonful—and that is not a fanciful picture, but one which is seen in every hospital almost daily. Unquestionably the mouths of surgical patients should be looked after, and I would suggest that the surgical patients can be divided into two classes, the one to be operated on in one or two days or a week, and the emergency patients. With the latter we cannot go through that careful routine of treatment of pyorrhea, etc., but we can remove the pus pockets. It should be made a rule, if possible, that the attention of the surgeon be called to the fact that the mouth should be cleared of pus pockets, abscessed teeth removed and in that way the danger of infection from the buccal surfaces will be reduced, because we do know that no patient will recover from anesthesia or any disease, as one who has a sterile mouth. That is a factor which has not received much attention and nothing much has been done in this direction. The care of the mouth of the medical patient is also a chapter which should be looked into carefully. It is an established fact that pneumonia is frequently the consequence of intestinal fermentation producing auto-intoxication, and that the buccal surfaces play an important part in that; therefore the sterilization of the mouth should become a factor in medical diseases.

DR. M. L. SCHAMBERG, New York: No hospital in the future will be thoroughly equipped without an outlet beside each bed from which can be furnished compressed air for cleansing the mouth. I see no reason why a simple plant such as is necessary for the supply of compressed air should be any great hardship on any institution. They are equipped with many similar necessities, such as plants for the care of the linen. We

may teach the nurses what should be done, but we must equip them with the means wherewith to perform their work. The hospitals are usually very generous in supplying thermometers and other necessities, and compressed air as a means of complete cleansing of the mouth is certainly a necessity. In regard to the work outside of the hospitals, done by the nurses among poor people, I venture to say if the manufacturers of these various tanks were encouraged to supply compressed air in small tanks as they supply oxygen and nitrous oxid, they could do so at a nominal cost, and this contingency would be met. I really think that compressed air is the only feasible way of cleansing the interspaces between the teeth, save by the successful manipulation of the dentist in his office. There is no reason why the private household, which equips its bathroom with needle sprays and other forms of conveniences, should not be equipped with some means of providing compressed air for the complete cleansing of the mouth, and I think it is merely a matter of education along these lines that is necessary to bring about this advanced step.

DR. M. L. RHEIN, New York: Hospital service varies greatly in different parts of the country. In the city of New York it seems to have been practically impossible to obtain stomatologic service in the hospitals. In New York City the medical staffs of the hospitals have been jealous of permitting any intrusion on that staff. They are willing to have stomatologists in the infirmary. That is not my conception of the field of our work in the hospital. Whatever instructions the nurses may receive in the training department of the German hospital, the patients receive very little attention. I agree with Dr. Lederer's statement about the preparation of patients prior to surgical work, and I know a great many able surgeons in New York City who insist on that procedure, and in other parts of the country. I agree with the great value of compressed air for this purpose in preference to anything else, and I follow that in my own practice. I have had installed a number of compressed air outfits in private houses at little cost; a motor pump can be attached to any electrical outlet, and that gives compressed air instantaneously. I have had great satisfaction in the introduction of such an apparatus, which is a comparatively cheap apparatus, and in a hospital it can be moved from bedside to bedside and simply attached to any ordinary electric outlet and the compressed air is immediately at the disposal of the operator as readily as the electric light would be. There is an additional objection to the use of hydrogen peroxid for this purpose, and that is the escharotic action on tissues, and especially in the delicate condition in which these tissues are during the early periods of convalescence from some diseases, those especially of the exanthematous type. At that stage the mucous membrane is in a delicate condition and anything as powerful as hydrogen peroxid is detrimental to the comfort of the patient and the welfare of the mucosa.

DR. JOSEPH HEAD, Philadelphia: Everybody has said that the mouth should be cleansed, but I will venture to say that nobody has said how it should be cleansed. In the first place, if the average dentist in this room will look in the mouths of his own patients, he will find that with healthy patients it takes constant coaching for them to brush their teeth often. The wisdom teeth are not ordinarily brushed at all. The twelve-year molars are not brushed properly, and the six-year molars are brushed fairly well, and the rest of the mouth may or may not be according to the care that the patient takes. This is to a certain extent due to the carelessness of the patient and also to the carelessness of the dentist in teaching many methods of brushing the teeth that are ineffective. In the first place, dentists, in giving instructions in brushing, tell the patient to brush up and down. If anyone will take a brush and try it on a skull, he will find that in brushing up and down the bristles will pivot so much that there is practically no bristle movement at all. We must understand that the wisdom teeth decay not because they are different from any other teeth, not because the structure is any worse, but because they are never brushed. Since dentists allow the ordinary patient to go with his mouth unbrushed, and can hardly get him to look after his



mouth, I think it is hardly to be conceived that the mouth of the sick patient will get very much more attention. But, we will take it for granted, for the sake of argument, that the mouth is made sterile; that the floss silk is used to remove the debris from between the teeth, and then the mucous membrane brushed thoroughly with proper bristle friction, where the toothbrush does not pivot. And supposing then that we sterilize the mouth, I understand when etherization takes place the air goes through the fauces, and it strikes me that any sterilization of the mouth without the sterilization of the nasal cavity and the fauces would be of very little value. It seems to me that we can hardly, by merely brushing the mouth and cleansing the mouth, expect to protect the lungs of the patient during etherization without cleansing the nostrils and the fauces any more than we could protect our feet from the mud if we made a safe walk one-third of the way up to our porch and allowed the rest to be muddy.

DR. S. L. MCCURDY, Pittsburg: Hydrogen peroxid is of no value in this particular field, or in surgery anywhere. In preparing the mouth for oral operations I always, the evening before the operation, have the patients cleanse their mouths with a brush, and then of course they get nothing in the mouth after midnight, and then when they awake in the morning and have their bath, the mouth is cleansed every half hour with normal salt solution. I rarely have any complications; indeed, it is difficult under these circumstances to infect the mouth, and as Dr. Gilmer says, it is almost impossible to have an infection following an operation, and I rarely have any in mine.

DR. W. C. FISHER, New York: Regarding the case which Dr. Flanagan spoke of in which it cost \$30 to use oxygen, if it were necessary to spend that amount for an entire outfit it would be lost to many hospitals forever. It has always seemed strange to me, especially in recent years, when there has been such a cry for pure food, pure drugs, and we have had Congress legislate to protect the public and give them something pure, when a person is sick or debilitated they are allowed to introduce pure food and pure drugs through mouths in such a condition that these pure drugs and pure foods are in a filthy condition by the time they reach the intestines for absorption. I think the reason that people do not brush the molars is that there are very few brushes on the market which the public can buy which will reach these places, but brushes with short bristles at the end can be made which will give plenty of movement at the end of the bristle—frictional movement. So again it is the fault of the dentist and not the patient, in advising them as to the kind of brushes to use. Dr. Gilmer objects to the cotton swab. I did not mean that the teeth should be cleaned with the cotton swab. I said that at times, such as Dr. Rhein has referred to, when the mucous membrane is so tender that a brush cannot be used, the best thing in that case is the cotton swab. It seems to me that if every barber's chair today can be fitted with an outlet for compressed air—and they do not consider it a great expense—that at least every bedside in our hospitals can have a compressed air outlet. Some one suggested that it would be practical to have compressed air supplied as nitrous oxid is now supplied in cylinders. There are automobile concerns already supplying these for automobiles, and there is no reason why the dentist could not get these and attach the spray bottle to them. Dr. Rhein, I think, is right when he speaks of the New York hospitals. Four years ago I was asked to take a position as dentist in one of the largest hospitals in New York, and the members of the staff told me that my position would be such that I would be confined to constructive work on the teeth in the public ward; just purely dental treatment, that is, the insertion of fillings occasionally and the treatment of abscesses. I would not be allowed any scope whatever as a stomatologist, and would never be allowed to treat an aural case, no matter if that was purely an infection from the teeth. No, that is the work of the rhinologist. When I understood what they wanted, I told them that what they were after was a constructor of teeth, or possibly a leecher or barber, and I refused the position.

## A TALK ON THE BUSINESS SIDE OF DENTISTRY.\*

By E. S. Barber, D. D. S., Chicago, Ill.

I NOTICED an article in the April *Brief* on "Provision for Unfortunate Dentists." Another article appeared a couple of months ago on this subject, and, in a few words, the idea expressed is to provide for some sort of old-age pension for dentists, through contributions by the working members of the profession.

Other journals are agitating the cost system in dentistry which is a good thing, to be sure, provided the outcome is to set the selling price high enough above the cost price to make a fair profit. However, in most instances, this idea is overlooked and the inference is given that dentists waste too much money and should better learn the art of saving.

This is all right in one way, but all wrong in another. What the dentists today need is not old age pensions to stave off poverty, but some practical business instruction during their working days, so they can take care of themselves and retire in comfort at a reasonable age. I do not think a dentist should spend his entire lifetime at the chair, any more than should the business man spend his whole lifetime at his business, whether the cause be either necessity or inclination. In Europe the custom is to retire when the worker has enough laid by for his family needs, and make way for some one else. In other words, to be satisfied with taking enough out of the common fund for his own use. In this country, if one can make money at all, he wants to make more money than anybody else, and is never satisfied this side of the grave, to let go.

If dentists could make more money during their active years, I think they would be more willing to retire at a reasonable age than the business man, by reason of the fact that working in a standing position for many years in itself would furnish a welcome excuse to desire an easier occupation.

These men of education and intelligence would not consent to absolute idleness, and while many would turn to other pursuits, still many would devote the remaining years to experiment and invention in dentistry and the science would receive such an impetus as it could receive in no other way, unless the government should finally establish endowed schools of research and accord to humans the same thoughtful care it does to raising hogs.

It usually takes from ten to thirty years of actual dental practice at the chair before the dentist is heard from in research work, and before his findings and conclusions are worth listening to. These men would be just in their prime, and each one by that time would have his pet hobby, which he had given a lifetime of study and through liking and knowing his subject, could easily improve the present knowledge by experimentation.

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\*Read before the Northern Indiana Dental Society, 1912.

I will attempt to give an outline of the business side of dentistry, for an outline is all that is possible to give in one paper. The business education required by a successful dentist is a longer course than that given on the professional side in the dental colleges. It is unfortunate that the schools do not make some attempt to educate their students in this important branch, for the reason that success in dentistry depends largely on business training, and if success could be divided into portions, I should give a proportion of 25% for professional training and 75% for knowledge of business. I have given this subject ten years' study for my own benefit, and have now reduced the proposition to a course of five lectures, which is the smallest possible number that can cover the matter at all.

At the most, then, this article will simply set you to thinking, and if it raises a doubt in your mind, it will at least have accomplished some good.

The three principal points in financial success as applied to dentistry are Salesmanship, Suggestion and Elimination of Pain. Of these three, the third is the greatest help, for, by a knowledge of this subject any dentist can double his practice in six months, and through gaining a reputation for painless work in his locality, will soon secure the more desirable clientele and be able to weed out his practice, cut down his hours, do more work in a day and at advanced fees.

I find that patients will pay any fee demanded, provided the work can be done without pain, and in a satisfactory manner. It is necessary in dentistry, the same as any other business, to absolutely deliver the goods, and the man who hopes to get through, using slipshod methods and old-fashioned ideas, will always be a back number and his case is not taken into account in this article.

So much good material can be found in any of the dental journals on correct methods for doing dental operations that I think that part can be disposed of in a few words in this paper. I take it for granted that a man who wishes to succeed in any business, should first try to learn his business a little better than his competitor, and should he find that he does not like the business, he should get out of it and do the thing he likes, for success only comes in doing the things we like and for which we are by nature fitted. Provided, then, that the dentist has the necessary qualifications and education, but has been so unfortunate as to have never had the advantage of selling goods of some sort in his earlier days, some few instructions on Salesmanship are in order.

I believe Salesmanship is the greatest thing in the world, and I would rather be called a successful salesman than to have any other title, for there is no business nor profession in which Salesmanship is not the dominating factor. Only during the past few years has the idea of Salesmanship been recognized in the profession. Dentists are more backward in this regard than are physicians, through having a false idea of a code of ethics and through trying to do business in the same way that it was done by our ancestors of the 13th century.



Suggestion plays a large part in our success as dentists. We either suggest fear or confidence to a patient, and a careful study of this subject will make it easy for the dentist to suggest confidence in every case, and, provided he can deliver the goods, that is, do his work absolutely without pain to the patient, he can in all cases suggest confidence, because he is telling the truth. In the old days many dentists would suggest to the patient that the work would be painless, then go ahead and hurt the patient and not only lose their own reputation for truth and veracity, but hurt the cause of dentistry in general.

Through the use of Nitrous Oxid-Oxygen Analgesia I have found it possible to operate on every patient that has come to my office without causing pain. Perhaps 5% of the patients treated need to be carried to the anesthetic stage, on account of some highly nervous condition or through absolute lack of confidence in dentists generally. However, through the use of suggestion, in nearly all cases, the patient will submit quietly to the operation in a semi-conscious condition, provided it does not actually cause pain. There is no objection to working under either stage of anesthesia, except that under deep anesthesia the patient has to be watched more closely, and it takes more of the operator's time from the operation.

The first requisite for success is Personal Appearance. A dentist is in a peculiar position as a salesman, for he has no goods or merchandise of any sort to sell, but must literally sell himself. With this end in view, he should at least think enough of his personal appearance to wear well fitting clothes, have a clean shave and clean collar each morning, keep his shoes shined, and be sure his finger nails are not in mourning. These are such little things that they are quite often overlooked, and still they make a greater impression on the prospective patient's mind than any argument that can possibly be made to an absolute stranger.

It is necessary in dentistry as well as in any other business to cultivate a pleasant manner in handling people. All big men are good mixers, and since our practice comes from our friends, it is necessary that we make as many friends as possible, and amongst a class who can afford to pay for our services.

I know of many dentists who make the mistake of associating with dentists almost exclusively. This idea is all wrong, for we secure our patronage from the laity, and not from dentists, and our leisure time should be devoted to cultivating the acquaintance of men of affairs. It is well to associate with older men than ourselves, first, because from men of larger experience we can always learn something, to broaden our minds and learn methods of handling men which will be useful at some later time. Besides, these older men usually need from \$100 to several hundred dollars' worth of dentistry done, and in most cases are financially able to pay for it. On the other hand, the younger men usually need very little dentistry and in most instances have very little money with which

to pay. Besides this, we would probably spend valuable time teaching them, for our experience of affairs would probably be the greater. A dentist cannot "talk shop" nor can he tell the prospect that he is the best dentist in his town; but he must, through his conversation and bearing, and through the educational service he renders the prospect, be able to prove to him that he at least knows his business better than any other dentist the prospect has met.

Most dentists get their business through advertising of some sort, some of it done through cheap methods of circulars, signs, etc., others through passing a collection plate at church and becoming prominent in lodges and clubs, so that they are placed in the "amongst those present" class, but I believe these ideas are largely wrong, and that a dentist should go after his business on the same basis that a business man would and leave the fake and sham methods so long practiced entirely alone. In other words, the day of the silk hat and long whiskers in dentistry is past, and from now on it will become more and more necessary to absolutely deliver the goods. With a thorough knowledge of anesthetics, a dentist needs no form of publicity whatever, for the public will hunt for him until they find him, and I believe a young man who could start in a new community and by operating on one or two patients without pain, secure all the business necessary in three months without any other form of publicity whatever.

However, I do not believe dentists at large will at once take up with this idea, because most dentists are not studying ways and means to improve their business, but are simply dragging along from day to day, satisfied with a little which falls their way. In fact, most dentists today are working entirely for charity. The fees charged would not interest a brick layer, for he could not afford to live on the amount earned by the ordinary dentist.

I have shown this anesthetic to over 8,000 dentists and of these a very small proportion have commenced its use. However, in most instances, the users are the big men of the country. The men who are broad enough to be willing to learn something, and then to put it in practice. For these men, this article is not necessary, but rather for those who have not commenced using modern methods in their practice. Having commenced a campaign on a worthy case, the necessary facts must be placed before him with discretion. To do this, the simplest way is to let him do the talking, for most big men like to talk, and if you can make him believe you are a good listener, you are bound to impress him favorably. Ask him questions about his business, tell him you are interested in successful men, try to learn all about it, and after he has told you how he secured his start and made his success, he will begin asking questions about your business, and then all you have to do is to answer. Now, provided you do know your business, it is so easy to tell him about the campaign of education now being carried forward by

dentists in the interest of the masses, and what modern dentistry is accomplishing in the way of effecting cures. Tell him that practically all disease enters the system by either the nose or mouth; that perhaps 95% of disease is caused by bad teeth alone, and that the medical profession is largely palliating or curing diseases which bad teeth have caused, and that the secret of health is to have at least twenty-eight perfect teeth in contact and occlusion. An educational talk of this kind is good for both of you; it gives the other man something to think about, and it broadens you by teaching you to present your case in a proper manner.

One of the most necessary requirements for success is good health. Dentistry is a sedentary occupation and most of us get too little exercise. Probably the best forms of outdoor exercise are automobiling and horse-back riding, for a dentist who works hard does not care to walk around much, and riding is to be preferred. In most instances, however, some form of physical culture is indicated, such as the system outlined by Prof. Simon of Chicago, in his book on "Physical Perfection." By following these exercises daily, say fifteen or twenty minutes each morning, followed by a tepid bath, and then occasional breathing exercises through the day, a dentist is continually fit for work. We all know that most dentists die ten years younger than the members of other professions. This is largely caused by working in a stooping posture, which cramps the digestive and breathing apparatus; by changing the position and exercising opposing muscles occasionally, these drawbacks can be largely overcome.

A dentist should always spend his office hours in his office, for the reason that when he is out, his office is practically closed, and what store could live a week with the doors locked, and no one there to attend to business? Besides, many a dentist has ruined his reputation by hanging around drug stores and pool rooms. There is no better advertisement than to be always busy. Every one admires the busy man and it is so easy to appear busy in an office at all times. If there is nothing better to do, it would certainly pay the ordinary dentists hundreds of dollars each year to spend his spare time reading the leading dental journals and taking such courses as Parkyn on Suggestion, and Sheldon's course of Scientific Salesmanship, to improve his mind.

The thing which probably appeals to the new patient most, is the appearance of the dental office. Having owned seven offices in different locations myself, I think enough of this one point to spend nearly \$3,000 in fitting up a suite of offices which contain practically all the good points found in the best offices which I have visited in the leading cities of the United States. I have had the color scheme mapped out by the leading artist in this line in Chicago, and all the furniture is new to start with, and every piece chosen for a reason. The first cost is secondary in importance to the impression made on the minds of prospective patients. It may be years before a patient can determine whether our work is a failure or not, whereas, the impression made by the appearance of the office is instantaneous, and the inference goes out that any man who thinks enough



of this detail and can afford it, must do his work properly to secure the necessary clientele.

Whether the office be expensive or not, it should at least be absolutely clean, and it is better to limit the amount of furniture than to limit the quality. The same care should be taken in following out a business system for the office that would be followed in a factory, or any other business conducted for profit. A great deal has been said in the journals of late regarding this item, and the only explanation I need give of it is, read the dental journals and you will find the matter thoroughly covered. My selling talk is somewhat different, I believe, from that of most dentists, and I learned it before I learned anesthetics, and could probably have succeeded in the old way, but by making a combination of the two it is almost impossible to fail. In the first place, most dentists talk to their patients from a mechanical standpoint instead of the standpoint of a professional man.

The dentist's field of operation is limited to an area of about two inches square. His outlook upon men and affairs in general is not from the same standpoint as the man who builds railroads and has the whole country within his line of vision. The public looks upon the dentist as a mechanic perhaps of a little higher order than the blacksmith. This was illustrated some time ago in preparing for a clinic at Columbus. A business man entered the room and said, "Is this a dentist's shop?" just as he would have asked about a tin shop or any other mechanic's establishment. On the other hand, the public looks upon the physician as the true professional man, and in selling our services I think it is better to sell them from a physician's standpoint. Teeth are of such small concern to the average individual, that I try to stay away from the subject of teeth as much as possible, in landing a case, and talk almost entirely on the subject of health, for every one is interested in that subject.

No dentist can afford to become a parrot, but must figure out his selling talk for himself, so I will simply suggest a few little points which you all know, but which your patient probably does not, and which will interest him exceedingly if placed in a proper manner. Years ago I sold magazine advertising, which is one of the hardest things to sell, and before starting on a campaign we would first write out our selling talk and then answer all the questions we thought could ever apply to it, and get the main points fixed firmly in our own minds before presenting it to the buyer. I think this is the proper method to use in selling dentistry. You cannot read the patient a paper on this subject, but you must simply tell him facts from your own mind. You will find that you will forget many points the first time, but that each time you tell it it will be more forcible and complete, until at the end of a few months you should be able to land every case for the full amount that comes to your office.

First, prove to the patient that nearly all disease comes through the mouth and that diseases of the alimentary tract are usually caused by improper chewing of the food. Tell him about Horace Fletcher, who was

given up to die at the age of fifty by all the doctors and who cured himself and has become a strong and healthy individual at the age of seventy through the proper chewing of food, which is a subject almost entirely overlooked by dentists. Since the bulk of our food is made up of starchy material, such as breadstuffs, vegetables, pastries, etc., and since the starch to be digested must first be changed to sugar through the action of the ptyalin in the saliva in the mouth, and in order to make this chemical change the food must first be ground up by the action of the teeth to bring the particles of starch in contact with the saliva, it follows that anyone who lives on starchy food, and does not chew it properly, could practically starve to death, for this food is simply carried through the intestines in an undigested state and rots and is eliminated, causing the system to be filled up with gases and poisons, which produce low vitality in the individual.

I usually show the patient an anatomical model with the teeth in correct relation, and then make models of his own mouth, showing where his teeth are lacking in either contact or occlusion, and explain to him how this can be remedied. The entire idea conveyed being that health is the one thing to be sought after and that the mechanical part of dentistry is simply one of the aids which I will employ to produce this effect.

Should a patient present to me in pain from tooth causes, I would relieve the pain at the first sitting, simply to prove to him that it could be done, and would make a charge for this service. I would then make a future appointment, which would give me time to look up his standing and see what fee he should pay for the necessary operations to restore his general condition to health. At the next sitting, I would give him a health talk, lasting an hour, and would either land this case for all the work I thought necessary in the mouth or dismiss him as not being worth while.

I have some models in my office, made before and after doing bridge-work cases, where the patient has made a gain of from twenty to thirty pounds in a few months, through being able to chew the food properly. Most dentists do not find the necessary work to be done in the mouths which present for examination. They are not salesmen, but are simply taking orders and doing patch-work for the patient as per direction. Most people have lost some of the molar teeth, and provided one tooth is lost on one side the usefulness of that side is usually ended. You can explain all these matters to the patient and tell him how you propose to restore proper contact and occlusion through inlays and inlay bridgework, and then, provided you can do the work, you will have secured a friend for life.

I know a great many dentists do not believe in this system, but I have done little else for seven years, and have made thousands of inlay bridges in my own practice for people who appreciate them. I have often asked them whether they were sorry they had spent the money and have never yet received an affirmative answer.

I consider this preparation of the patient of so much importance that when I have secured their consent and the case is actually started, I consider my part of the contract practically finished, and feel that any good

workman at \$25 per week could finish the case as well as I, and provided the case is carried forward satisfactorily and painlessly, the patient will invariably thank you for doing something for him that no other dentist has ever attempted, and usually, before the case is finished, will have brought in one or two other new patients for services.

Now, just a word about fees and I am done. I believe the fees charged in all instances should be as much as the patient can afford, for the reason that it makes them appreciate your services more, and at the best dentists will never charge too much. Always secure a deposit of from one-third to one-half in advance, which makes the patient a partner in a contract with you, and then they are as much interested as you are in securing results. Simply make a plain business statement at the outset of what your price will be, and the amount of deposit required and how the balance must be paid. Do not let the patient at any time boss the case, for if he does he will boss the fee part also. Treat him courteously at all times but insist on doing the work the way your judgment dictates, and, provided your educational talk has been properly presented, you will never have any trouble on this score.

#### DISCUSSION

E. R. KIBLER, Indianapolis, Ind.: Mr. Chairman, Dr. Barber, Ladies and Gentlemen: Dr. Barber simply stated a few facts and he has given us food for thought, and I hope we will profit by it, and I agree with practically all that he has said.

The first thing that attracted my attention was this: "The three principal points in financial success, as applied to dentistry, are SALESMANSHIP, SUGGESTION and ELIMINATION of pain." How many of us try to see what we can do in the way of salesmanship? If a patient has been to a dentist that has been using amalgam fillings, that is all they put in. They do not try to better the condition of the mouth at all. They simply go ahead and put in some more amalgam fillings. How much better would it be if we would find all the faulty fillings and sell that patient gold inlays and restore that mouth to better condition. That is what we should do, and that is the way we can broaden our field. If we would take the mouths that we are now in charge of and give them proper attention we would have all the work we want to do. The trouble is, we don't do that. We don't grasp our opportunities.

Suggestion is a big factor of success in the practice of dentistry. If you will pardon me, I will mention a little incident that happened to me. I was visiting a dentist at Rochester, Ind., who had been trying to use analgesia on a certain lady and had been having no success. One day I was sitting in the office and this lady came in. This lady sat in the chair and the dentist told her, "Now, out there is a man who formerly taught me and gave me instructions how to use N<sub>2</sub>O when I was in college. He uses it himself all the time to remove pulps. He is out there, and if we want him to help us he will." He went ahead and removed the pulp, and removed it without pain. He had her mind right. He tried the same thing before, time and time again, but failed. That goes to prove that it is suggestion that does the work. He also had her confidence. So, if we suggest those things properly to our patients there is no doubt but what we can accomplish what we want.

The elimination of pain is one of the biggest factors in practice building we can employ. As Dr. Barber states, we can build the kind of practice we want. If we want a cheap practice, with cheap fees, we can get it. If we want a high class practice, we can get it. If we want to receive larger fees than our neighbor we must get out of the rut we are in and get some new methods. Use the ones Dr. Barber has outlined for us today, and I am sure we will get results.



T. R. HENSHAW, Indianapolis: I am very glad that there are some things in Dr. Barber's paper with which I do not particularly agree. While the basis of his paper is undoubtedly true, there are some exceptions which I desire to make.

In the first place, I am not one who believes that the dental profession is so poorly and badly paid as is always suggested at every dental meeting. If you take a look at most of the dentists who are here today you will see that quite a few of them came up here in their automobiles, and if there were waterway all the way up they would most probably have come up in their motor boats.

I think Dr. Barber's comparison with wages of the bricklayer is very badly made. I am of the opinion that we don't receive enough for our services, but we certainly do not deserve such a comparison as that. Going back to the actual fundamental of the whole thing, I do not wish to put it on the basis that Dr. Barber has at all. The fundamental of the thing that counts as the biggest factor in our success is quality of service. If your service is of sufficiently high quality you can sell it, because, if you have that service at your finger ends, you do not have to talk anybody into buying. He is going to buy it in spite of himself. If you were to have no competition you might have to do a good deal of talking; but take the up-to-date young man today in the dental profession—I have been watching them a good many years now, and I want to say to you that they are putting their practice of dentistry on a very different basis now from that of the past, and as a consequence these young men are demanding and receiving better fees.

Of course we all know the facts of suggestion, the facts of selling talk, of salesmanship, but neither of these is the big thing. The big thing is, what can you do for the man who comes into your office? Dr. Barber is right when he says that many of us fail to see all that the mouth needs. A patient comes in and says that he would like to have a certain piece of work done. You do that, and then allow him to leave your office. He has in his mouth the need of a great deal more of dental service, which you can sell him if you can state the case. If your service is such as it should be, then you can cause that patient to demand of you that sort of service, not only for himself but for his friends.

Now, Dr. Barber suggested that we divide a man's training into 25 per cent of professional training and 75 per cent of business training. I would suggest 25 per cent of business training and 75 per cent of professional training, and the other 100 per cent of culture. That is the thing that we are most in need of. We need to be better educated men. If we haven't had the opportunity to be better educated men, we have the opportunity for self-education, and no man is doing himself justice who doesn't secure it. You can get it. A young man came into my office the other day who has but one year to secure his A. B. degree from one of our colleges. He is going to be a mechanical engineer, and in course of conversation with him he asked me what I thought as to whether he should go on and secure his A. B. degree or should he switch around and change his courses so that in one or two years he would receive his Science degree. I told him to secure his Bachelor degree before he secured his Science degree.

I started towards a Bachelor degree in my youth, but I did not think I had time to secure it, so I side-tracked and secured my degree of Doctor of Dental Surgery. If I had it to do over, nothing in God's earth would prevent me from securing my Bachelor degree before the D. D. S., and that is a degree that a dentist needs today more than any other thing. If you have the goods you can deliver the service. I don't wish to decry Dr. Barber's selling talk, but I still declare for the idea that an education comes first and foremost.

Dr. Barber says that it is absolutely necessary to be a good mixer. I don't think so. It is possible to be a good mixer and secure a good business, but it isn't necessary. Because of this fact, nine-tenths of the patients that you receive, if they are of the class that are willing and able to pay large fees, are people whom you can't possibly hope to affiliate with socially. You know you can't. Therefore, you would be ashamed to associate with them if you could not spend the money they spend, and therefore it

isn't necessary to mix with those people. If they want your services they will have heard of you, for the reason that your services are all right and better than those of some other man, and they are bound to come to you. They will find you if you are down in the alley. Of course, the office should be the very best that you can possibly afford, and you should be able to meet your patients with the right sort of invitation and cordiality and expression, and by all means you should be able to eliminate the big factor of pain. I cannot too forcibly express my approval of the use of nitrous oxid and oxygen.

I wish to commend Dr. Barber for his paper because it is a good one. I will say that I was a little bit disappointed in the fact that it was not as beautifully connected as it might have been, but he knows what he is talking about and, from his standpoint, his selling talk is a great thing. You can't deliver Dr. Barber's selling talk. You would be a parrot if you did. You cannot take his talk and do anything with it. You cannot take mine and do anything with it. You can make one for your ownself out of the material that you have just received from such men as Dr. Barber, but don't get the notion that it is the big thing; it isn't. The big thing is the kind of service you give your patient. Take it from me.

DR. BARBER (closing): There is one thing that I would like to have mentioned in the paper that I would like to have mentioned in that little talk last night—it takes me fifteen hours to give my complete business talk, and I can't squeeze much of it into a little paper.

Now, there are two kinds of people in this world. There is the kind of man who thinks quickly and knows exactly what he wants. Then there is the other kind of individual who isn't in a hurry, and you have to approach him differently. Now, you have to tell those men the same things in different ways. You must talk rapidly for the lightning fellow. You give him the headings. He is the fellow that goes through a newspaper and just looks over the headings. You have to put that selling talk to him in a few words, and, yes or no, it is all over. The other man will sit in the chair and go to sleep if you approach him in the same way. I have tried that, and he would go to sleep when I was making my selling point. To him you must talk slowly and elaborate each point, for he thinks slowly. You will fail either way if you get your system mixed.

I want to say this much about amalgam fillings: I have quit making them, and long ago, when I had poorer fees than almost anybody here. I have a different class of people now than I had a few years ago. I usually make a plan that when a patient comes in and has teeth filled with amalgam fillings, I take them out. It is a pretty safe proposition to take them all out and start all over, for there is usually as much decay beneath as amalgam above. A mouth filled with amalgam is not artistic, and you can't make anybody think so. Besides, amalgam discolors the teeth anyhow, and it's hard to tell whether the discoloration comes from the amalgam or decay. Some fellows say, "This won't do in my town." You people don't know how I hate to hear a person say something like that. I believe if a man here would say that I would start a fight. It is the song of failure. In my classes that is about all I hear for a day or two, but before the week is over we generally stiffen up their spines enough so they get their backbones where their wishbones have always been. All there is to success is hard work. I don't work one-half as many hours as I did three or four years ago, but I make several times as much money. If you are working eight hours a day, work seven from now on and buy yourself a nice desk that you are proud of and sit down at that desk with a pencil and paper and figure out how to run your business. Other business men do that. Dentists work almost entirely with their fingers, but they should work more with their heads. If dentistry were organized in such a way that we could hire men to put in fillings after we had diagnosed the case and sold the goods, we could make ten times more money than the other way. But the people want personal service. Suppose you went into Marshall Field's in Chicago to buy a necktie and insisted on the

manager selling it to you, it would cost you at least \$1,000, but if you buy it from a \$6-a-week employe it may cost only a dollar or two.

Any dentist can get washer women patients, and the beginner gets these and dead beats, but there is no profit in either class. Now, there is no honor in that, and there is another kind that there is no honor in getting and that is the millionaire patients, for these nearly all come through social connections. My selling talk is planned for the average dentist working for the average patient at the average prices. If a patient is used to paying \$25 for a crown and you charge him \$10 then he will go away. He will think that you are not as good as the other man.

There are many men making money in dentistry who are really not entitled to any praise, because of some social or family connection which brings their business. Now, I stated in my paper that there have been enough papers written on the theoretical side of dentistry, so I will not talk on that side at all. I simply said, if you don't know your business you could not use your selling talk. Why don't you make some money? Study this side out? I think Dr. Henshaw is wrong here about bricklayers. This selling talk is taken from statistics. I have worked on it for ten years. I remember some of the names of men whose material I have used, but not all of them. Not one statement I make but can be proven by statistics which I have gathered carefully for years and which I know by heart and could repeat if I had time. During one of my classes in the Business Side of Dentistry, the dean of a prominent dental college and Dr. Gillis and I were out to dinner one night and Dr. Gillis told him what the average man in Indiana was making. How much was that, do you remember, Dr. Gillis?

DR. GILLIS: \$1100 per year.

Well, I know of dentists that are making more than \$1100 a year. A few of them have automobiles. That doesn't mean that they are making much money. Lots of them have automobiles who ought not to have any at all.

Now, this argument about the quality of the service is an old-time argument. I was taught that in college years ago in ethics. Every time the professor came in we sang, "Nearer My God to Thee." I know there are lots of old men in the profession that are fine workmen, but some of them are objects of charity. We have one in Chicago now that is an object of charity, though one of the best dentists in the world. Why is that? He can do the work better than I can. He can do the work all right but he can't make the people believe it. When I was in the publishing business I put a man out selling magazine advertising. He did not succeed and he scared every man away he talked to and made everybody believe absolutely that magazine advertising is a failure. This man formerly made a success selling dry goods, but could not sell advertising. Dry goods could be seen, but the benefits of advertising could not—they are like dentistry, the results to be obtained are all in the mind of the man who does the work and cannot be seen till delivered. Salesmanship, I will repeat it men, is the greatest thing in the world. It is greater than all the professional learning you can get. If a fellow has natural personality, business comes to him; however, most anyone can develop this by study. If you know your business, patients will send other patients to you and you may succeed, but it will take ten years longer. Why not do it faster? I want to say again, that this talk is for the average practitioner. I say that a dentist that gets ten dollars for a crown can make \$10,000 a year. If a patient comes in with a pain he says, "Doctor, I want to get this pain stopped," and he stops it. If he would do the thing these people ought to have done, he would receive greater fees. I don't get big fees all the time—I get them once in a while. Now, we will say that an inlay is worth \$10 if a crown is. With analgesia I can cut ten inlay cavities in an hour without any pain. I can take the wax impressions in another hour and set them all in one or two additional hours. Now, I can easily get \$100 for that case from any person in ordinary circumstances, and do it all in one day. That isn't such bad business. I had a fellow come to my office and say this wouldn't do in his town. He brought up that same argument about small fees and I said, "Now look here, boy, cut all that out. Many of those people are coming to Chi-



cago, 600 miles away, to have me fill their teeth. Why don't you keep them at home? They ask me why their dentists don't get these up-to-date methods." I said to him, "Just keep these people at home, you need them and I don't." (It happened that a number of the best people in this town had come to me for services.)

About this point of "mixers"—now, one of our well-known millionaires of Milwaukee has practiced all through life to mix in with everybody. He brings out this illustration: If a lead pencil salesman comes to his office he asks him to be seated and passes the time of day. I am just giving this for an illustration. He listens to the lead pencil salesman, and if he doesn't need any pencils he says so in a nice way and invites the man to call again. Now, what is the moral? This man goes out happy without the sale, and should anyone mention lumber, which is this particular millionaire's business, the lead pencil salesman will surely tell what a fine fellow the other is and do his best to land an order. Now, I maintain that you *can* associate with millionaire patients, and these people expect lots less of me than the middle class people do. People in the suburb where I live try to out-do each other. They are people of small means. Over along the lake, where they have money, they can afford to do as they please, and you will see a large share of the population running around the streets barefooted and in bathing suits enjoying life. I find that when a millionaire patient takes me out to dinner he pays for it, but the other fellow expects me to pay for it.

Some times the boys who come to Chicago to take my course will say, "Doctor, will you give me a written copy of this to take home?" I say "No, because it will not be of any use to you. You must learn it anyhow, so take these instructions from me and work it out yourself." A selling talk is made up simply of facts. You have to get facts. They can be easily obtained by reading the dental journals. I take twenty-eight of them. You can't get anything by only taking one or two of them. Lots of times I find good articles in college journals or others of small circulation and get lots of facts from them. I have a drawer in my desk where I keep clippings out of newspapers, and magazine advertising, any facts that apply and learn them and get them in my head and work them into my selling talk. When a person comes in where one of these facts apply, if five years later, I have the stuff right there and can go to it.

## THE BUSINESS SIDE OF DENTISTRY\*

By George Edwin Hunt, M. D., D.D.S., Indianapolis, Ind.

IT SEEMS to me the business side of dentistry is almost as complex and has almost as many ramifications as the departments of operative and prosthetic dentistry. The business side of dentistry involves first, the getting of a practice; second, the getting of the proper fees for your work, and third, the investment of your surplus money, and each of these is capable of considerable amplification.

I will only speak briefly on the getting of a practice, as I presume you have all already gotten them. Personality is the great practice-getter. Good work is the practice-keeper. To get a practice quickly one must have faith in oneself and the ability to inspire that faith in others. That is personality. A gracious manner, the ability to make acquaintances, culture, a clean person, and a clean, well-equipped office are all assets in getting a practice.

The second division I have made, that of getting the proper fee for your services, cannot be so lightly dismissed. There is no more reason why

\*Read before the Northern Indiana Dental Society.

all dentists should get the same fees than there is that all physicians or lawyers should get equal fees. Some dentists are more skillful and more experienced than others and are, therefore, entitled to higher fees.

Furthermore, the size of the fee will have to be governed in a degree by the ability of the client to pay, and on the relative prices of other things in that community. For instance, a dentist with a practice largely composed of clerks, stenographers and other wage-earners of moderate incomes must, perforce, content himself with smaller fees than the dentist whose practice is drawn from the employers rather than the employees. And a dentist in a small community, where the cost of living and of doing business is much less than in a large city, generally has to fit his fees more or less to the general conditions prevailing. People in the smaller towns do not spend so much on house rent, dress, amusements and such things as people in larger places, and they expect their dental bills, in a degree, to be regulated by their scale of expenses in other lines. So that the size of the fee is bound to vary in different communities, and even among different men in the same community. This latter is less apt to be the case, however, in small places, where there are from two to, say, four or five dentists than it is in the larger places where there are a great number of dentists. Where there are only two to four or five dentists the scale of prices should be practically the same, each dentist doing his share of charity, or partially charity, work. Where large bodies of people are gathered together, as in cities, it is inevitable that the clientele of some of the practitioners there will be able and willing to pay larger fees than the clientele of other practitioners.

I believe in concert of action among all the dentists in small cities and among groups of dentists in large cities. I do not believe in the efficiency of fee bills, as they are usually adopted and enforced—or non-enforced—because all these efforts in the past have been based on the rather sordid theory that those subscribing to the bill need all the money they can get.

I think the average dentist is paid enough for many operations and not enough for many others. The trouble is that many of our operations, consuming more time than others, perhaps more showy, have had a low valuation placed on them by the dentist himself, and of course the patient is pleased to accept the opinion of the dentist on that point. To cite instances I will mention amalgam fillings, partial dentures and repairs on dentures. Why is not a good amalgam filling, which preserves and makes useful the tooth, worth as much per hour for its making as a gold filling? Why is not a partial lower, carrying six, eight or ten teeth, which requires as much or more time and really more skill to construct than a full lower denture, worth as much or more money than the full denture? Why should not a repair case, which takes several hours of the dentist's time and the exercise of his professional skill, be remunerative to the dentist instead of a loss? Can any one give a reasonable answer to these questions beyond my own answer, that the dentist himself has put this undervaluation on his services?

I do not believe any one man in a small community, nor a few men in a large community, can regulate their fees justly without the cooperation of their fellow practitioners in that community. I am not talking now of the exceptional cases, men whose personality, combined with a high order of skill, enable them to get fees out of proportion to the majority of practitioners. In all, I say I am talking of the *average* practitioner, not the exceptional ones. One man, unaided, cannot adjust his fees on what I believe to be a reasonable basis, if they are much out of the way, but several men, with the proper light before them, *can* do so.

Let me explain. If I were one of two or eight or twenty dentists in a community, or if I were one of twenty dentists in an office building or in a certain neighborhood in a large city, I would try to convince one of my confreres that a meeting of all the dentists in that community or that neighborhood was desirable. Then I would make that convinced dentist go with me and help convince one other man. And I would have that other man go with both of us to convince one more. And I would continue that until the sheep were separated from the goats. And I would have that first meeting in a dental office or a hotel parlor, or where you please.

At the place of meeting I would have a blackboard and some chalk. And I would either elucidate the problem of the dentist's working hours, as set forth in *The Dental Digest* some months ago, or I would have some one else do so. Then I would start a general discussion on how long it takes to do some certain operation, setting a banded Logan, for instance. The discussion would undoubtedly bring out the facts of how much per hour you are getting for that service, and those present who were only receiving remuneration at the rate of one dollar per hour would need to sign no fee bills to induce them to raise their fees on that operation. At subsequent meetings I would take up other operations, and, if the first meeting was properly conducted, there need be no fear of the attendance at subsequent meetings. In this connection I cannot do better than to call your attention to a series of articles headed "Common Sense," which are being published in *Oral Hygiene*.

Then I would accumulate a drawer full of things to use in my talks with patients when they complained of the prices I asked for my services. I would have extracted teeth containing amalgam fillings with overhanging gingival margins—that some one else had put in—and narrow proximal surfaces showing the lack of extension for prevention. And I would have teeth filled with amalgam fillings that I had put in myself, with proper contour, broad bases and perfect margins. And on the first I would point out the flat contact point, the recurrence of decay due to lack of extension, the poor finish, and all other defects, and on my own case I would call attention to the correction of all these faults and then I would say, "This latter is the kind of work I propose to do for you, and I cannot afford to do this kind of work for the price you would pay for the other kind."

And I would have a bum gold crown—preferably on an extracted tooth. Heaven knows they are not rare—and a perfectly contoured, neat-



fitting one that I had made myself, and I would call attention to all the bad points on the one and all of the good points of the other. And then I would make my little speech.

And in a dozen other operations that will occur to you, such exhibits may be used to advantage. To most people a gold crown is a gold crown and an amalgam filling is an amalgam filling. They recognize no difference. Whose fault is it? Nobody's but yours. When a dentist says, "I cannot take the time to have a patient come back for me to polish an amalgam filling. I cannot get any more for the filling than the other fellows do and they do not do that," I know at once that there is a fellow who has not grasped the "Big Idea" of Brother Bill, which "big idea" is simply to do better work and get better prices for it. But you cannot get the better price unless you convince the patient it is better work. Most people know that a five-dollar pair of shoes will look better and last as long or longer than two pairs at three dollars, but they do not know that a fifteen-dollar gold crown—granting it is *worth* fifteen dollars—will outlast, look better, be more useful, and preserve the health of the mouth better than a five-dollar crown. It is astonishing how many people are willing to pay for the best if they know there is a best and believe they are going to get it. Our friends, the advertisers, know this, hence they advertise: "Teeth, three dollars. Best teeth, five dollars." The mistake they make is in not having a clear impression of what "best" is, and living up to it.

The foregoing refers to getting a practice, and especially to getting adequate fees for your services. Now, about taking care of your money. Again I must refer to the "Common Sense" articles in *Oral Hygiene*. One trouble with dentists is that they bank in their pockets too much. What you should do is to put yourself on a weekly salary—and keep within it. So sure as you put all cash receipts into your pocket, just so sure are you to spend money foolishly. Keep tab on your receipts and the cost of doing business for a few months until you know approximately what your income is above your actual outgo for doing business. Then fix a salary for yourself that will enable you to save some money, and then live as rigidly within your salary as though you were a clerk instead of your own boss. When cash accumulates in your cash drawer, bank it.

What sort of investment you shall make is often a serious question. As a general proposition, I would avoid stocks of all kinds. Never buy stock of any kind that is advertised in the papers, and never buy stocks that "promise" to yield large percentages of profit. There are millions and millions of dollars' worth of capital that is looking for safe investments that will pay six per cent or more. This money is in the hands of men who make a living at handling money, and if there are any legitimate business propositions showing chances for an unusual profit, the promoters do not have to come to you and me for capital. In fact, the very fact that a promoter has to advertise his stock for sale shows that the wise men in the country do not care to take a chance in it.

If you have the moral courage, and it takes real moral courage, to allow your savings to accumulate until you have an appreciable number of hundreds of dollars, well selected first mortgage loans on improved real estate are as safe as any form of investment you can make. Whether they are as remunerative as some other form of investment will depend somewhat on the tax rate in your county. In Indianapolis the city, township, county and state tax rate is now \$2.18 per hundred dollars, and as six per cent is all you can get for your money on a safe mortgage and as your mortgage is taxed the above 2.18 per cent, you net only about 3.8 per cent on your money. In other counties, where the tax rate is lower, a higher net rate of interest may be had.

Good bonds are a good investment, probably the best and safest there is. Indiana gravel road bonds are, as a rule, safe and they are non-taxable. They net from four to five and a half per cent. First mortgage railroad bonds on well-developed properties like the Pennsylvania, New York Central and other good roads, are safe and reliable. Bonds of such well-known corporations as these should be bought during some period of depression in price, periods which come at recurrent intervals. If you are going to buy any bonds listed on the Stock Exchange you should avoid those selling much below par unless you have more knowledge of the condition of the corporation than you are apt to have. The fact that they are much below par indicates their weakness. If I were going to invest in listed bonds I would write the financial editors of the *World's Work*, *Colliers* and the *Cosmopolitan* magazines and base my choice on their answers. These men are students of the market and financial affairs and they have no incentive to deceive you. Do not buy on "tips." James R. Keene, probably the most successful market speculator of modern times, says that with a big organization costing thousands of dollars per year, constantly engaged in getting him information of value, he can guess right only three times out of five. If that is true, and it is, what chance has your friend who knows a man who has a friend who has a brother in the office of the broker who sometimes does business for Ogden Armour, to get information of any value. If you are bound either to speculate or buy for investment on "tips," spit on a shingle and whirl it in the air. If it comes down wet, buy. If it comes down dry, don't. That is as good a tip as any one you know is likely to give you.

Often public utility corporation bonds, your local street car company, electric light company, water works, etc., are good and safe. Take your banker's advice about them before buying, and be sure he is not a director, too. Ask him if he will loan you money on them, and how much. The advantage of this sort of investment is that it is always before you for inspection.

Here is the best plan I know of for saving money: Suppose you have one hundred dollars saved up and in all reasonableness may expect to put aside a hundred dollars a month, especially if you know you have obligations to meet. If it is only fifty dollars a month, the principle is the same.

Consult your banker about bonds in the denomination of five hundred dollars or less. When you and he are agreed on the desirability of a certain bond, ask him how much he will loan you on it. If he has been advising you honestly and well, and especially if it is a bond that his house is handling, he should be willing to loan you four-fifths or more of the selling price of the bond. Suppose it to be a five-hundred-dollar bond selling at par. Buy one of the bonds from him, pay your one hundred dollars and borrow the other four hundred dollars from him, putting up your bond for collateral. If the bond bears five per cent interest, the interest on your bond will a little more than take care of the interest on your borrowed money, but it will not give you any interest on your one hundred dollars. At the end of the month pay off one hundred dollars of your loan and borrow three hundred dollars. That second month the interest coming to you on your bond will not only take care of the interest on the three hundred dollars borrowed money, but will pay you six per cent on your original hundred dollar investment. In five months you own your bond free of debt. As soon as you get another hundred dollars together, buy another bond. Do not wait until you have five hundred dollars in cash. If you do, it may become apparently necessary for you to take a trip to Indianapolis or Chicago, or buy a couple of suits of clothes, or an automobile, or something, and you do not get your bond. If you buy the bond and owe that money at the bank, it will be easier to put off the trip and the automobile.

Another and a very good way to save money is to buy improved or unimproved real estate in your home town. If you buy improved real estate I would advise that you buy either business property, and that is frequently beyond the means of a dentist, or cheap residence property. I presume conditions in other cities are about as they are in Indianapolis, and there the best returns on rental property, aside from the expensive business district, are derived from inexpensive dwellings rented for from five to eighteen dollars a month. In buying real estate you should look up the assessment on it, find out what relation the assessment has to the selling price of the property in that vicinity, and then take the judgment of an expert, if you can find one that will be honest with you. Size up your town and try to get property in the path of the city's growth. Better pay a little more, if necessary, to accomplish this. If you do this, in a few years your "unearned increment" may be larger than the amount you have received for rental in that time.

In buying unimproved real estate your only hope for profit is in the "unearned increment," that is, the advance in the value of your land owing to the growth of the city in that direction, so that good judgment must be exercised in the selection of your investment. In fact, real estate investment requires more knowledge of values and sound business judgment than most of us have, and should be approached with caution.

In closing this very general paper I may remark that I was probably selected to write it on the same principle that causes a bachelor to be nom-



inated for running the "Hints to Young Mothers" column in the papers, because of his practical ignorance of the subject. If I had followed my own advice for the past twenty years I might have been as well off today as you younger men will be in twenty years from now--if you follow it.

## DISCUSSION

W. H. SHAFFER, North Manchester: I must say that Dr. Hunt's paper is a very good one. I do not know that there is anything in his paper that I would take away from it, but I might add just a few things.

In the first division, he says that it is practice-getting that counts and that good work is the practice-keeper. All good work counts in dentistry. It takes something more than good work to keep a good practice. The first step to responsibility is to do your best. A great many good dentists have made a failure by not doing their best. To succeed one does nothing but work, work, work--work from morning until night. After you have a good practice, then establish your office hours and keep them. When you promise to get work done at a certain time and the person comes in for that work, always have his work ready at the stated time. After arrangements have been made with a patient, that patient should not be disappointed.

I believe there is one thing I would take from Dr. Hunt's paper, that of taking examples of work and showing them to the patients. If I could get as good a pair of shoes for three dollars as I could get for five dollars, I would take the three-dollar pair of shoes. The same way for dental work. If I could get as good a gold crown and one that looked as good for five dollars as I could for fifteen dollars, I would take the five-dollar crown.

Dr. Hunt's observation on the investment of money is good. I believe there is nothing better than gravel road bonds. I believe another good investment is to buy property and rent it.

HUGO H. MEIER, Ft. Wayne: I must say that in reply to Dr. Hunt's paper, that the business side of dentistry, as given by him, is the finest I have ever known from my own experience in the business side of dentistry. In dentistry the first thing is to get a practice and then to know how to keep it. I think that the only way to keep up a good practice is by good work. Some dentists spend their time in the pool room or the bar room. A man to be a good dentist has to spend most of his time at his office. Adding these few things to this paper, Dr. Hunt has mentioned all that is important to the business side of dentistry.

There's a bad side, 'tis the sad side—  
 Never mind it!  
 There's a bright side, 'tis the right side—  
 Try to find it!  
 Pessimism's but a screen  
 Thrust the light and you between—  
 But the sunshine's bright, I ween,  
 Just behind it!

—Jean Dwight Franklin, in "The Circle."

## LIVING FOR HEALTH.\*

By George E. Harter, Toledo, Ohio.

**I** SUPPOSE that my contribution to the proceedings of your convention is likely to be unique in that, while other speakers and essayists devote their time and efforts to an attempt to better fit their fellows to look after the health of those who come to them for help, I shall endeavor to at least outline or hint at a method of living by which dentists may take best care of their own health and efficiency.

Of course, indirectly, my work is in line with all that has been and shall be said and done here. No man can do his best unless he is physically fit, the asseverations of the control-of-matter-by-mind faddists to the contrary notwithstanding. This is especially true of men in your profession, whose work is so peculiarly and perpetually nerve-racking and exhausting that, of all professions, dentistry holds out to its practitioners the certainty of the shortest life, without the compensating advantages of any particularly noticeable increase in its hilarity. "A short life and a merry one" was a current aphorism before dentistry was invented. Of the members of all professions, dentists are the shortest lived.

When we stop to consider the difference in intellectual development between the average dentist and his average fellow-man, we cannot but be struck by his very apparent failure to use any part of his intellectual superiority for his own advantage, for the preservation of his own health and efficiency and the lengthening of his own life. It seems as strange as it is true that increased health, strength and longevity do not keep within measurable ratio of the increase in general intelligence. So generally true is this that the fact has passed into a proverb, with which all of you are, of course, familiar:

"Each generation grows weaker and wiser."

Of course, this is only relatively true; not true at all if we look below the surface of things. It could not pass current for an hour were it not for the fact that no distinction is drawn in the average mind between intellect, knowledge and wisdom. This, quite regardless of the truth of that other aphorism from one of the poets, often our best teachers, that "Knowledge and wisdom, far from being one, oft have no connection."

I trust I may be pardoned for presuming to give you a few definitions, intended to help to make clear just what I am trying to say, not because I suspect that any of you require them:

*Intellect*: The faculty or power of obtaining knowledge by instruction, by observation, and by experience.

*Knowledge*: Memory of facts gained through the action of the intellect.

*Wisdom*: Applied knowledge. The essence of knowledge in operation as applied to the conduct of life.

\*Read before the Northern Indiana Dental Society.

With these definitions in mind, it becomes less difficult to understand why men, possessed of keen, bright, active, well-trained intellectual faculties, who may be rated as being perfect store-houses of knowledge, yet permit themselves to drag out short and miserable spans of half-alive, anemic, neurasthenic, melancholy existence.

With all their intellect, with all their knowledge, they lack wisdom. They are either unable or unwilling to set their knowledge into action; to convert it into wisdom that shall result in health, strength, efficiency, comfort and success, each contributing its full quota to the lengthening of a useful life.

No more bright and shining examples of such lives need be searched for than those of college professors, rich with the thoughts of other men, usually cut off at the period when ripeness and maturity should render them most useful to their fellows and to themselves.

It is with the intent of at least trying to suggest a remedy for some of these things that I come before you today. I aim to put you in possession of facts which, if accepted by you and converted into wisdom, ought to have a wide and deep influence upon the lives of every one of you.

I regret that it is impossible for me to claim any part of what follows as the result of my own original research. All that I shall say came to me as the result of the untiring labors of other men—or, rather, of one other man, possessed of an intellect as rare as it is profound, of a heart as big as all humanity, and of a wisdom seldom equalled among men: of a man who, in concluding the labors of ten years and turning over the results to a few in whom he had absolute confidence, made it a matter of honor that his name should be allowed to remain unknown.

This man, when I first knew him, was engaged in a successful and profitable business that he had established. Fire came and swept away the accumulations of years. Beginning again at the bottom, in five years he had regained all that he had lost and more. In the midst of his success he was inspired by one of those ideas that occasionally take hold of men's lives and transform them. He determined to devote himself body, mind and soul to the success of his business until he had acquired what most of us would consider a very modest competence, and then to withdraw from the world and devote the remainder of his life, if needful, to the investigation of the causes of human ills and their eradication or amelioration.

The time soon came, for he acquired wealth rapidly. He then proceeded to carry out his program to the letter. He sold his business and simply dropped out of sight. His most intimate friends, his family, those who had his entire confidence and had been told of his determination, lost sight of him as completely as though he had been swallowed by the sea.

This man had had a collegiate and technical education along the lines of physics and chemistry. With these two branches of science and with higher mathematics he was thoroughly in love. He had no other wife or



mistress. Of anatomy and physiology he had only the usual college smattering; but, ten years afterward, when his work was done, no man on earth, I thoroughly believe, could compare with him in knowledge of the human structure, morphology, bacteriology, cell life, proliferation, exfoliation, and those grand arcana of health, ingestion, deglutition, digestion, assimilation, elimination, osmosis, exosmosis and metabolism.

How this immense fund of knowledge had been acquired is a long story, and one that he would not thank me to repeat, nor shall I attempt it. Suffice to say that for ten years, lengthened almost to twenty by nights of study added to days of the most slavish labor, spending his own money as well as lavishly drawing upon his vital forces, this man worked as only an angel or a fiend can work, for the accomplishment of his great purpose.

Almost all of the sciences now known to man were called upon to assist him; but direct, first-hand observation of the vital processes of human existence, carried on in his own laboratory, hidden from the world, backed by the highest skill in analytic chemistry, directed along the lines of his trained and governed intuition—these were his chief reliance.

When his labors were concluded he could say with the Apostle Paul: "I declare the things that I do know and proclaim the things that I have seen."

I am here to lay before you the results of the labors of this man; results achieved only at the end of herculean labors, to offer them to you freely, for what they may be worth to each of you, without money and without price, and without being able to reveal to you the name of the man to whom the world will some day recognize such a debt of gratitude as never before has been earned among men.

If written by a Haggard or a Kipling, an account of this man's life for ten long years would read like the veriest romance and gain for either of them added renown. All I can hope to do is to lay before you, in briefest manner, an outline of his work.

For three years he followed lines already travel-worn by the feet of other and older investigators, with practically no satisfactory results except the establishment in his mind of one great conclusion: that health, strength and longevity depend wholly and solely upon Nutrition, with its two great phases, assimilation and elimination.

At the end of that time he made a radical change in his methods, added miniature hospital wards to his laboratory, secured so-called incurable pauper patients, and began to break his way through a jungle hitherto untrodden by modern investigators.

Brought to a high state of practical efficiency by three years of constant and solitary application, his great knowledge of chemistry was applied to the selection and preparation of foods for his patients, and their administration in place of drugs. He was rewarded by most astonishing and gratifying recoveries. Nearly ninety per cent of his "incurables," given up to die by practitioners of high order, were discharged as per-

fectly well men, each with a snug little sum in his pocket with which to begin life anew.

The result of all this is an addition to the sum of human knowledge that may already be traced in the newer methods of treating diseases. If any of you have been reading the medical journals of late, or have even kept reasonably close watch of the later developments of science as recorded in the current literary journals, you will have noticed a very radical change in ideals and methods. Advanced physicians no longer treat diseases nor symptoms. In fact, they now recognize all so-called diseases as merely symptoms of cellular derangement or unbalance. They no longer load the blood with one poison in the hope that its antagonism to another will result in the neutralization of both. The effort now is to supply nutriment, to give to the cells something that they need, something that will so reinforce their weakened powers as to enable them to repel or subdue the invading hosts of pathogenic bacteria, and so restore the equilibrium that means health, strength, comfort and long life. Dr. Paul Erlich and Dr. Duncan Campbell Ross have shown themselves to be leaders in the movement toward more rational handling of the sick, which is based upon a knowledge of cell life that may be formulated about as follows:

All physical bodies are built up of cells.

All growth is cell growth and proliferation.

All health is cell health. A sound body cannot be built up of diseased or debilitated cells, nor can an organism or body remain well and strong if inhabited and made up by weakened cells.

Disease is not disease at all in the ordinary sense: It is simply a manifestation of cell hunger carried to the danger point.

All foods must be cell foods if the health and efficiency of the bodily organism is to be maintained.

All digestion is cell digestion. Stomach, bowels and all the other so-called organs of digestion are merely soaking vats in which the food supplied may be in a measure prepared for the action of the cells in completing the work of digestion. Food is converted into a substance that may be taken up by the blood-stream and conveyed to the cells. Not an atom of food can reach the cells except through the blood. The stomach cells may be literally screaming for food; at the same moment the walls of the stomach may be distended with foodstuffs, yet not an atom of that food can reach the cells direct. It must all be reduced to such a condition that it may be taken up by the glands, poured into the arteries and conveyed through them to the cells.

Cells do and can digest but one kind of food. All foods taken into the stomach must be converted into cell food if they are to fulfil the purpose of food to the cells. Foods not so converted must be eliminated. If retained in the cell, its digestive and metabolic apparatus is disturbed. Not only does the cell fail to receive its needed nourishment, but its efforts to assimilate the improper foodstuff carried to it in the blood-stream, which will be put forth in the absence of something better, results in auto-intoxi-

cation—self-poisoning—which immediately inhibits growth and proliferation, and, unless removed promptly, is the cause of the death of the cell.

Properly nourished cells are able to carry their proper activities and discharge their varied functions without interruption. When the cells that make up our bodies are in good health, and each is doing its part in the great machine, health of body is the result. Pain, disease, is the cry of the hungry cell for food, or for the elimination of poisons resulting from the effort to make use of improper, unassimilable pabulum supplied to them. Properly fed, the cells can take care of themselves. All they demand in return for the labor that they perform ceaselessly for the good of the whole organism is proper food. Lacking this, they sometimes attack other cells, sometimes rebel and wander about in search of food, sometimes sicken and die—always they refuse to work.

Since cells require and can properly assimilate but one kind of food, it would seem to be self-evident that such foodstuffs as are richest in the elements that make up that food, and in which it is most easily convertible, should be selected by those of us who prefer health to disease, strength to weakness, life to death; and it is just the selection of such foods and their proper preparation and use that I call "Living for Health."

People in fairly good health require nothing more than this to maintain and greatly improve that state. Others, less fortunate, require a preliminary course of dietetics, etc., in order that poisons already threatening the efficiency, even the life of the cells, may be eliminated. This preliminary treatment consists of the use of the juices of fruits and of raw vegetables, water, bathing, breathing and other exercises, sanitary sleeping quarters and common-sense living generally.

Some of the recoveries brought about by the methods herein merely referred to are so remarkable as to seem almost miraculous. In many tuberculosis camps they have been adopted with remarkable results.

I do not claim to be alone in the possession of this knowledge. It has been given to others, and already it is abroad in the world. There are even some who are taking it up and exploiting it for money; who are selling the priceless knowledge that has been given to them. With that and with them we have no concern. Each man to whom this knowledge was given was left perfectly free to use it as his own.

Here is an example of the manner in which this knowledge is sure to spread:

H. O. Benson, M.D., Grand Junction, Colo., writing in the May, 1911, number of *The American Journal of Physiologic Therapeutics*, says that for ten years he was a sufferer from progressive intestinal indigestion, characterized by coated tongue, abdominal distension and tenderness, frequent griping pains, irregular and very foul stools, alternating constipation and looseness, gastric burning pain, eructations, appetite varying from indifference to voraciousness, three or four times a year temperature rising as high as 103 to 104½ for three or four days at a time, accompanied by



very fetid exhalations, flatus and foul stools; insomnia, headaches, neuralgias, frequent attacks of lumbago, catarrh, mental depression and obesity. His wife had been a similar sufferer almost from childhood, having several attacks of suppurative tonsilitis each year, and also suffered greatly from chronic inflammation of the uterus.

Their two children required laxatives almost daily, besides having two to four sharp attacks of gastro-intestinal fever each year, with very foul breath and passages the rule.

All of these symptoms, without exception, promptly and permanently disappeared from this family upon the discontinuance of the use of common salt three years ago. There was no other particular change in the diet the first year; since that time the diet has been shaped toward the elimination of foods containing more than one per cent of organic mineral matter, or ash.

A third child, now twenty-eight months old, never has tasted salt nor any foods containing salt, more than a dozen times in its life, when eating away from home. Salt foods are very distasteful to it. It has perfect health, red cheeks, bright eyes, and shows good mental and bodily growth.

Dr. Benson's conclusion, after making this particular branch of the great subject his especial study, is that the use of common salt with our foods is responsible for the following pathologic conditions:

1. The inhibition of the production of saliva, gastric juice, pancreatic juice, bile and intestinal fluids.
2. Tardy absorption. Salty solutions are absorbed in a ratio inverse to their density. The more salt the slower the absorption.
3. The transudation of serum into the digestive canal. Serum is neither digestive nor digestible in the intestines.
4. Retards digestion and promotes the growth of pathogenic bacteria in the digestive canal.
5. Favors fermentation and putrefaction in the food contents of stomach and bowels, not only depriving the body of nourishment but also liberating toxins that are absorbed and exert deranging effects upon the nervous system and all bodily functions.
6. Lowers nutrition, and therefore glandular efficiency throughout the body.
7. Lays the foundation for numerous tissue derangements and degenerations.
8. Invites pathogenic germ invasion by lowering the resisting powers of phagocyte and leucocyte.
9. Produces thirst for water or some diluent, which, when accompanied by physical distress and mental depression, constitutes the basis of the prevalent demand for narcotic stimulants and drugs.
10. Causes a condition of hyperosmotic tension, constituting a true tissue edema, abstracts water from the cells, robbing them of their necessary fluidity, consequently lowering their efficiency.

The law of osmosis, the passage of fluids through tissue, is as immutable as the law of gravity. When two solutions of unequal density are placed on opposite sides of an animal membrane the solutions will, by osmosis, equalize their densities. The character of a living cell is such that it cannot vary its proportionate constituents beyond very narrow limits, hardly exceeding one-half of one per cent, without lowering its efficiency. When a blood-cell is placed in a solution of less than forty one-hundredths of one per cent salt, the cell will absorb water and swell, tending to its final solution and destruction. When the solution is over ninety hundredths of one per cent salt, the cell will give up part of its water and shrink. Either condition is pathologic, lowering the efficiency of the cell. The same is true of all cells, when the lymph is of a density beyond or much below that of normal solution.

When the contents of the mouth have a saline density greater than that of the blood plasma, glandular activity gives place to exosmosis. Instead of healthy saliva, capable of converting starches into a non-fermentable form, the food is moistened by the transudation of a serous fluid that is not digestive, and the starches go into the canal in company with ever-present yeast germs, to undergo inevitable fermentation.

The gastric and pancreatic juices are, in the same manner, inhibited from rendering their protective and digestive assistance. Further, the production of saliva is inhibited by the presence of over-salt solutions, and the demand for drink to moisten the food is created, to facilitate deglutition, still further diluting the fluids and reducing their digestive efficiency.

Under the hypertonic condition of the tissue serum, the tissue cells are shrunken, assimilation and elimination rendered less active, clogging the entire system with waste products, giving us such symptoms as are commonly spoken of as biliousness, to relieve which physicians issue seventy-five per cent of their prescriptions — simply to stimulate elimination.

These conditions entail a long list of symptoms—neuralgia, rheumatism, arterio-sclerosis, neurasthenia, catarrhal mucous membrane in nose, throat and elsewhere, diseases of the viscera, of the pelvic organs, kidneys, glands, eyes, ears and various functional disorders, particularly functional masculine impotency.

The diet in common use contains mineral constituents to the extent of two to four per cent, to which we add usually two per cent of common salt, the most active osmotic agent of them all, making approximately six per cent, while the human system can withstand only about one per cent and retain its efficiency at the normal standard.

Dr. Benson declares that he has been searching medical literature for three years for scientific reasons for the use of salt with food, and confesses a complete failure. Such reasons are non-existent. So far as medical science goes, there positively is no reason for an atom of it in the food we eat.

The radical elimination of salt is the first step in this much-needed reform. The selection of such foods as contain a minimum of lime and potash, and a maximum of elements in condition most nearly assimilable by the cells, is the next and equally important step. Failure, more or less complete, is sure to befall any dietary regimen that does not take all of these things fully into account.

Foods may be roughly divided into three classes according to the qualities inherent in them. These are Tissue Builders, Energy Releasers and Refrigerants. In the first class must be placed all animal foods: Meats, fish, fowl, butter, milk, eggs; also nuts, and some few fruits. In the second class belong nearly all the so-called dry vegetables: grains, potatoes, beets, onions, carrots, parsnips, etc. Among the Refrigerants we class the green vegetables—lettuce, spinach, melons, etc. This latter class is a very useful one, although life could not possibly be sustained by their exclusive use. Of course you know that life is merely a state of combustion; the constant tendency of the body is to burn up. Every movement represents a certain amount of combustion. It is the purpose of the refrigerants to reduce the temperature to a safe normal and keep it there.

It is the office of the tissue-builders to repair the waste, to replace matter consumed by the combustion constantly going on, and to supply needed materials for growth.

All the energy that we have for use on this planet comes to us from the sun; where the sun got it or gets it is another story, and a very interesting one for those who care to look into the real and inner nature of things. Vegetables depend altogether upon the sun for their growth; that is, without the sunshine they could not grow and develop. They are the great storehouses of energy. This explains why vegetarians, or those who are largely vegetarian in diet, are far more energetic in mind and body than the meat eaters. They are conceded to be capable of long-sustained exertion to a greater extent than the meat eaters.

The human body at its present stage of development requires a mixed or diversified diet. All of the various combinations of elements represented by these various kinds of foodstuff are necessary to make up the one kind and one form of food that the cells require. But in the making up of the balanced ration, care must be taken not to take into the digestive tract kinds of food that are antagonistic to each other. We often hear complaints that certain kinds of food "do not agree with" this one or that one. Now, it is an established fact that all kinds of food agree with the internal economy of the person eating them, but many kinds of food are antagonistic to each other.

Take, for instance, the starches. We derive our needed supply of starch from the grains in the form of bread, potatoes and rice. The food element in all of these is starch. As in other parts of the domain of natural law, unlike things attract and like things repel. When two or more forms of starch are taken into the system at the same time, a double antag-



onism is set up. There is war between the different starches, for one thing; for another, the system, by the law of selective affinity, will choose one of them and reject the others. This means that but one of them will be attacked by the digestive juices and prepared for cell-digestion, while the others will remain in the stomach to ferment, cause indigestion, sour stomach as it is called, and all manner of discomfort.

This would seem to indicate, as the part of wisdom, that we take into the stomach but one of the starch-bearers at any one meal. Based upon this idea, we should eat either bread, or potatoes, or rice, any one of them, but not any two, much less all three of them, at any one meal.

This selective idea should also prevail in the selection of vegetables. Unless we have carefully studied the subject and know which of the vegetables are friendly and which antagonistic, it is best to confine the diet to but one kind of vegetable, in addition to potatoes, or bread, or rice, at any one meal.

Beans, the common dry bean of commerce, should not be eaten by men and women of sedentary habits or occupation. They are really not fit for human food at all. Pythagoras taught his pupils, centuries ago, that beans were antagonistic to severe or arduous mental application. String beans, when fresh, are good food.

There also are antagonisms and affinities among fruits, even to a greater extent than among vegetables, and those who care to be well and get better should eat but one kind of fruit at any one time.

Oranges, early in the morning, are almost a specific for some troubles, but the pulp should not be eaten. The expressed and strained juice of one or two oranges an hour before breakfast is a most excellent beginning for any day, no matter whether you are well or sick. An entire breakfast on that fruit taken in that way is also a splendid idea.

The ordinary polished rice of commerce should not be eaten by any one at any time. Rice should make up a far greater proportion of our diet than it usually does, but the rice used should be the unpolished article, as it is used in oriental countries. We hear of Japanese soldiers living for days on a few handfuls of rice—but it is not the ordinary polished rice that we usually buy.

The rice in common use is put through a polishing process by which it is reduced about one-third in weight and at least 75 per cent in nutritive value. The weight is restored by giving it a coating of paraffine or a mixture of glycerine and talcum powder. Of course such a composition is unfit for food, while rice as it comes from the thresher is one of the best starch foods we have.

I understand that quite recently a shipment of some thousands of pounds of polished rice, the ordinary rice commonly sold in the stores, was seized by the government, and that experiments are being made with it for the purpose of deciding whether or not its sale should be prohibited. Under the law as it now stands, polished and coated rice may be sold, but

the inner sack must bear a stencil stating that it is coated, and also giving the ingredients of the material used for that purpose.

Our pure food law is, I think, defective. It aims only at protecting the consumer by letting him know what he is buying. We may buy anything that is offered for sale, no matter how unfit for food it may be. All the government aims to do is to make it possible for the consumer to know what he is buying. Just how well the law works in practice may be inferred from the case of polished rice. It is sold to the retailer in hundred-pound sacks. As stated, the inner sack is branded; but what about the sacks in which it is sold to the consumer? It is sold, of course, in very small quantities. You go to the store and ask for a pound of rice. You get it, of course; but there is no stencil of any kind on the little package that you carry away. The dealer may or may not see the inner sack. But it is certain that the consumer never does. If he did, the average man or woman would know little or nothing of the meaning of the stencil. We buy things with our eyes shut. I do not know that it makes much difference, however, so long as we buy and eat all manner of things simply because they taste good. Too many of us are governed by our palates, rather than by common sense. Take the matter of salt. Not one in a thousand ever stops to think that the eating of salt is a purely cultivated or acquired taste. Nearly all of our tastes are cultivated or acquired; few are natural. If you will drop salt from your diet for a month or two you will be surprised to learn the natural tastes of the foods you are eating. You may not like some things at all—some of the things of which you are now very fond may lose all their savor for you. Others that you now dislike may become your prime favorites.

Salt is, of course, one of the necessary factors in nearly all vegetable foods; but there is plenty of that element in them as they are. If you drop salt long enough for the body to arrive at its normal stage, you will be surprised, probably, to find that some celery and some lettuce is too salty for your taste. Many of the things we now eat with a relish are made palatable by the added salt.

Let us endeavor to return to Nature in the matter of eating. If we do that, the high cost of living need not trouble us much.

Efficiency is the end that all of us are seeking. Efficiency means power to do better work and more of it than others are doing. It also means perfect management of the complicated apparatus we call our body. If we could but realize all that is meant by "self control," there are very few of us who would be willing to continue living in the ordinary, haphazard, hit-or-miss, devil-may-care method that now prevails among even the best of us. If we could be induced to exercise the same care of our bodies as we do of the tools of our profession or industry, the world soon would be revolutionized.

Food is or should be eaten for the one purpose of repairing waste, adding energy, and increasing efficiency; yet the result of most feeding is

the exact opposite. If the cell could be allowed to choose the food we eat instead of the palate, here is about what it would demand:

Juices of fruits; raw vegetables; some cooked vegetables; eggs; some meats; cereals; bread; water. This all sounds very easy, very much like the diet to which most of us are accustomed; but there is as much to be said concerning the method of preparation and the time to eat as concerning the foods themselves.

The pulps of most fruits are mineral, indigestible, and unfit for food. This is especially true of oranges, the juice of which is almost immunizing against some forms of disease, particularly those of a uric acid origin.

Rather than prolong this paper by a discussion of the relative merits and demerits of certain foodstuffs, I will bring it to a close by prescribing an ideal dietary for a man or woman in ordinary health, with running comments as to the whys and wherefores.

One hour before breakfast take the expressed and strained juice of two oranges and half a lemon in enough distilled water to make a large glassful. Use distilled water or rain water, if attainable, because such water is free from mineral salts, the direct cause of premature senility and early decay of physical capabilities. Of course, the system needs these mineral salts, but we get enough, often more than sufficient, in the vegetables we consume. Distilled water is a perfect solvent and will carry with it out of the body all the unassimilated and unassimilable mineral salts that remain after the deglutition of the food taken. Ordinary hard water is not a solvent at all. It passes through the body just as it goes in, because most of it carries in solution as much of the mineral salts as it can dissolve when drunk.

Breakfast: Toast, with unsalted butter, and as many eggs as you care for. Nothing more, nothing different.

The bread may be wheat or rye; whole wheat is best for most people; it should be thoroughly toasted all through, not merely browned on the outside. Raw eggs are better than any kind of cooking. If cooked, they should be as nearly raw as can be relished. If cooked, they should be either steamed in porcelain, shirred, which means baked, soft boiled, soft fried in sweet butter, or soft scrambled, also in sweet butter. They should be cooked only lightly, whichever method is used; the white should always melt in the mouth. Eggs should be cooked in porcelain, not metal; if in metal, aluminum is least objectionable. A poached egg is an abomination to the stomach.

If fruit is preferred for breakfast, it should be eaten as instructed for oranges and lemons: the juices expressed and strained. In this way, you may take all the fruit of *one kind only*, that your appetite craves, but if this is done nothing else should be eaten at that meal.

Luncheon: Rice that has been boiled or cooked three hours in a double boiler. Take with the rice as much pure cream as you like, with *cane* sugar; not beet sugar. The test for cane sugar is this: If in lumps, rub two lumps of it together in the dark. If cane, it will appear slightly luminous;



beet sugar will not. Instead of the cream and sugar, lemon juice and sugar, or orange juice and sugar, or raw or slightly cooked eggs and sweet butter may be used. Personally, I prefer raw eggs, with lemon juice and sugar. A nice variation is to mix the rice with eggs, lemon juice and sugar, put into an earthenware vessel, and bake slightly.

Dinner may be a meat or fish meal. Beef, mutton, fowl, game or any mature meat may be eaten, or any kind of fresh fish. No pork, veal, lamb, spring chicken; no immature meats of any sort; no pickled, preserved, canned, dried, deviled, or smoked meats. With the meat eat potato, boiled or baked with the skins on, cooked until "mealy." Eat with the meat or fish and potato, preferably green peas or string beans, and either lettuce, celery, spinach, salsify, carrots, parsnips, rhubarb, or any other *one* "green" vegetable.

Onions, either stewed and eaten with their own juice, or raw, may be eaten at any meat or fish meal, no matter what other vegetable or vegetables are used. Onions fit in and are compatible with all the others.

If preferred, rice may be substituted for the potato at this meal.

Bread should never be eaten unless toasted, or twice-baked; and should not be eaten at the same meal at which either rice or potato is eaten.

Bread means *bread*; not pastry, nor biscuits, nor crackers—except shredded wheat; it does not mean cakes, nor waffles, nor rolls, buns, muffins, nor any of the other substitutes for bread.

The evening meal may be bread and meat, instead of potato and meat; and if the bread is used instead of potato or rice, the vegetables mentioned may be used. Asparagus is harmless, but is rather high in nitrogen, making it rather a meat than a vegetable, just as bananas are a bread and not a fruit.

When meat is eaten, it is best to chew and chew it until all the juices are extracted, and reject the stringy fibre that is left, which is indigestible and simply causes fermentation.

Soups made of vegetables, enriched with sweet butter, may be used freely; but none of the ordinary soups, made by boiling the uric acid out of bones and joints, are fit for food. No sauces, cream gravies, or anything of the kind should be eaten.

If preferred, the mid-day meal may be made from one kind of nuts or fruit of any kind that is found to digest well.

Drink nothing with meals. If tea, coffee, wine, beer and the like are craved, one cup or glass per day may be taken, not less than an hour after any meal.

Salt is responsible for many ills, and should be banished from the table entirely. A very little may be used in cooking, at first, if the food is not relished without. It is surprising how soon the palate learns to do without it, then to reject it. The cells never want it; it means simply stagnation, atrophy and finally death to them, and they know it. Vinegar, mustard, and all such, spices and condiments of all kinds must be left off

at once and entirely. Lettuce, prepared with lemon juice and sugar, is delightfully appetizing. If something of the kind is craved, substitute lemon juice for vinegar, sugar for salt.

Personal habits have much to do with the benefit that we hope for. Breathing, sleeping, bathing, walking all these have their places. We will take them in order:

Learn to breathe deeply and rhythmically. Upon rising in the morning go to the window, or better, go out of doors. Stand or sit in a perfectly natural and easy but quite upright position, shoulders back, head held high. Expel all air from the lungs. Then, breathing through the nostrils, fill them to their full capacity while counting eight pulse-beats. Hold the breath while counting four beats. Release the air slowly, permitting it all to escape while counting eight beats. Breathe easily two or three breaths; repeat seven times. Repeat the entire exercise seven times each day, always at an open window or out of doors, winter as well as summer.

Too much trouble? Oh, very well!

When retiring, lie prone; close the right nostril; fill the lungs through the left, counting eight beats; hold four beats; exhale through the right, holding the left closed; hold the lungs empty for four beats; fill the lungs through the right, exhale through the left, and so on, inhaling and exhaling rhythmically through opposite nostrils until the process has been repeated seven times.

Deep, rhythmical breathing soon will become habitual. If you will but consider that of all of our vital organs the lungs are the only ones fully under the control of the will, you will realize what this may mean to one who is trying to live a life completely as designed by personal consciousness manifesting through the will.

Always go to sleep lying on the left side, rather to the front than the back. About midnight you will turn over onto the right side. If not, do so as soon as you awaken, and remain on the right side at least an hour before rising. Sleep six to eight hours, and get in two of the eight before midnight if possible. The sleeping room should be as nearly the same temperature as out-doors, winter and summer, as may be, but never heated above fifty by artificial heat. If the temperature is at zero outside, it should be nearly zero inside. Pile on all the cover you like; the nose and face will not freeze, whatever the temperature. There must be both an inlet and an outlet for the outside air. This means two windows in the sleeping room, or an outlet somewhere. The inlet should be open just enough so that a draft may be felt upon the back of the hand held ten inches to a foot from the opening. The outlet must be very much larger, say a window wide open. The natural inlet and outlet may be found by experiment with a candle or a smudge of smoke, which will flow from the inlet to the outlet, no matter how far away it may be. In my own there are two windows, but both are inlets; my outlet is into a ventilating shaft

about thirty feet away, down a hall. You will get the idea. You want a flow of outside air through your sleeping room while you are in it. A temperature of sixty to sixty-five is also best for your living rooms in winter. If you live as your cells know they should live, you will not take cold every time a little cold air strikes the body. That is what cold air is for. Personally, I very much enjoy a snow bath, no matter how low the temperature; have rolled in the snow, stripped, with thermometer at ten below zero.

Two complete baths per day should be taken, a rather cold one in the morning, immediately upon rising, before taking the breathing exercise, and a rather hot one the last thing at night. In drying always rub toward the heart—upward from the feet and hands, downward from the head. All life is combustion; there is but one combustible element in the world, carbon; carbon cannot be burned without producing soot; soot deposits on the outside of the body and must be removed by washing, precisely as dirt is washed from hands and face. When bathing, take your time in dressing. The longer you are naked and feel comfortable the better.

I thank you.

#### DISCUSSION

DR. OTTO U. KING, Huntington: It was on a farm in Huntington county, Indiana, in the late summer of 1880—one of those hot and lazy afternoons when all is quiet and not a leaf stirring. The cows had come up from pasture and were idly chewing their cuds; the hogs and sheep were contentedly lying or standing in different parts of the barn lot, giving to the whole place an air of quiet contentment.

There might have been seen two boys playing. The farmer came from the house and, after salting the horses in the barn, went into the barnyard and meted out to the hogs and cattle their share. After he had gone the boys stood there and noticed, with interest, how the animals licked and chewed the salt, and it seemed to give them much satisfaction and pleasure. The elder boy turned and said, "Father forgot to salt the chickens." And so, conscious of doing a dutiful task, the chickens were given an abundance of clean, fresh salt. But to our surprise and sorrow, the boys' father reported the next morning that the chickens were all dead, and father impressed the matter on me in such a manner that I preferred standing to sitting for several days after.

When I received and read this beautiful narrative of Mr. Harter's on salt, I had no trouble in recalling my experience in salt, and from then to now I have never forgotten that "what is one man's food may be another man's poison."

#### MY DISAPPOINTMENT

While reading this interesting story I was led on from step to step looking for his panacea to "Living for Health," something like the man lost on the desert and in search of water is led on from place to place by one mirage after another. And when at last, almost famished, he reaches a lake of crystal coolness, he is stunned by the fact that he cannot drink therefrom because of the discovery that it contains some poisonous mineral substance.

When I found that the panacea was the "discontinuance of the use of common salt," it left a bad taste in my mouth. It was so disappointing to me that I immediately turned to Holy Writ to learn what the God of the human race, in HIS INFINITE WISDOM, says. He says, "Every oblation of thy meal-offering shalt thou season with salt; neither shalt thou suffer the salt of the covenant of thy God to be lacking from thy meal-offering!"



Even poor old Job had *sense* and *wisdom* enough to know the value of seasoning with salt, for he says: "Can that which is unsavory be eaten without salt? Is there any taste in the white of an egg?" (Job 6-6).

Mr. Herbert W. Fisher, of Yale, says: "Salt is as necessary as sugar." Bernard Shaw gives us the value of sugar by saying, "It is now common knowledge that an army can march farther and fight harder on candy than on beef, and in recognition of this fact chocolate tablets form an important part of all regular rations in the United States army."

Fisher continues by saying: "Indeed, very few people know how necessary salt is. It is so necessary that table salt alone is quite inadequate. Table salt is only one kind. We need a dozen. We need this dozen to help us in sundry assimilative operations and also to build nerve and bone, after the manner of protein. It so happens, however, that Nature did not forget to supply this dozen—one and another—in nearly every food that lives and grows. That is one reason why variety in our starches, proteins, etc., is important—to insure variety in the accompanying salts." But clear table salt may be grossly overeaten, to which we all agree, for if used in too large quantities is merely eliminated, to the detriment of the kidneys.

#### SALT IN MEDICINE

Salt is so valuable to the human system that in medicine it has often been employed (in solutions) to restore to the system the fluids lost by severe hemorrhage or profuse diarrheal discharges.

#### OLD AGE VS. COMMON SALT

On last Monday I took dinner with my grandfather, who will soon be one hundred years old. He is still eating three good, square meals a day, seasoned with all the common salt he wants. When I told him of this new salt theory he said, "Another one of those mushroom panaceas for health! Now, my boy, let me tell you that the trouble with your generation is that you are getting too far away from the common things of life." How long grandfather would have lived without salt I do not know, but it does occur to me that a man living for one hundred years has surely served his day and generation and should be satisfied.

#### CONCLUSIONS ON WRONG PREMISES

The conclusions reached in the paper relative to the flow of saliva, gastric juice, pancreatic juice, bile and intestinal fluids, tardy absorption, the transudation of serum into the digestive canal, retarded digestion, fermentation, and putrefaction in the stomach and bowels, and all other tissue derangements and degeneration, in fact every conclusion is based on false premises and may be easily answered by the best scientists of the day as due entirely and wholly from other causes than common salt.

#### TRUE CAUSE

Ludwig Cornaro suggested that all persons in his time ate more than was necessary; most persons ate twice as much as was good for them; and some who were extravagantly gluttonous ate ten times as much as was their most economic need; and Cornaro, who was a dissipated wreck at forty, reformed his manner of eating and lived to be a hundred to prove his declarations. Cornaro lived more than three hundred years ago, forty new editions of his book have been published in English alone, and yet no one ever disputed the possibility or probability of his claim. We all know that this great Italian dietician and philosopher was wise and uttered wisdom, and we are told that most, if not all, of the diseases which pain, worry, and affect us are caused by indigestion or malassimilation of food, the result of some indiscretion of eating.

Our bodies, like an engine, require far less of repairing material than fuel, but we have been accustomed to including in our diet every day from two to three times as great a proportion of repair material as our system needs. Twenty to thirty per cent has been of the protein element. Now Professor Chittenden of Yale, by observation

through test with a squad of soldiers, reduced the protein element to ten per cent, and even by laboratory observations found that their needs had been exactly met by the supplies. Therefore, the excess had served no purpose but to produce clinkers in the human engine. These clinkers are far more damaging than mere fat or carbohydrate clinkers. Nature does the best she can with these clinkers, adding additional adipose tissue and ramming the residue about the insulted system, so that in a few years she beats and grinds out of our tissue that softness and resiliency, and we are old and stiff at an early age.

But there is worse behind. The clinkers of an engine only obstruct. The clinkers of the body decay. Before Chittenden's contribution to the subject were made, Mechnikoff, in Paris, had already thrown into terrific relief the known fact of auto-intoxication, or self-poisoning. This is a process carried on by putrefactive germs, namely, anaerobes—enemies, whose method is to fasten by billions upon the tissue-building foods; and, having fastened upon these, to set up a distillery therein after the descent into the intestines. Through the walls of the intestines the poisons thus generated are absorbed and enter the blood. The resulting condition—auto-intoxication—is now pretty widely suspected of lurking obscurely at the bottom of our most specific alimentary ills, bursting up and suffering transmutation into the form of one or another of these ills according to what organ or process in our bodies it finds most vulnerable.

Of all the effects of overeating, then, the most dismal and the most universal is probably auto-intoxication; and of all the foods which are overeaten, the most fatal are the proteins or tissue-builders.

So much you have learned from the book of wisdom. But without the book of joy how are you the better for wisdom? Wisdom measures things. Have you a scale by which to measure either the energy you have spent in your day's work or the potential energy of the unconsumed fuel on your dinner table? No. Wisdom can only tell you what to put on the table—the first of two great needs. She cannot tell you what to do with the food after it is there—what parts to select and how much to eat, nor (unless you are first caged in a calorimeter) can she tell you to what extent you actually over-indulge. And all this is the second of two great matters.

Now, there is a solution to this second problem of diet—how to conduct yourselves in the actual presence of your food. But the solution is not to be gained by arbitrary prescription, since it depends altogether on the pleasure you have in what you eat. Nothing will avail which will not appease your appetite.

If your appetite is not appeased your digestive secretions will simply go on a strike; and then your food, however meritorious its claims, will be powerless to do anything for you. Cases are on record of prescribed diets which failed—failed because they irked the patient; and cases of patients who proceeded to restore their own health by taking the bit in their teeth and doing as they pleased. Do as you please and half the time you go more or less astray; do as the doctor pleases, and some of the time your appetite will balk.

Mr. Fletcher, a Fellow of the American Association for the Advancement of Science, has discovered that our appetite is our thermometer, and that you need not sit in a copper chamber and have your heart-beats measured, nor call in a chemist to count the calories in your meal. All such measures are unnecessary since his rediscovery of the discriminative powers of the palate. Possibly you have been thinking of Mr. Fletcher as the man of forty chews or some arbitrary number. Mr. Fletcher has not come into the world at all to preach chewing, but discrimination through pleasure, and more pleasure through tasting; it is true that more tasting can only be had at the cost of more chewing, but it is the tasting and not the chewing that should be conscious, for he says: "Taste is one of our senses and was given us for a purpose. All other operations should be as unconscious as breathing.

"You will become a free man only when, by the comparative flow of saliva and the comparative sensations of taste, you are led to prefer some parts of your meals to others and to put aside, without fear of the cook, anything for which you do not find

your palate eager and your saliva generous. This discrimination of taste will not only refuse to let you swallow what is not liquefied, but will tell you in advance what is not going to yield graciously to liquefaction, and refuse to let you receive it all."

Moreover, whenever the appetite is in doubt, do not eat. Eat only when your appetite shows its own mind, and you will rejoice for food, like the appetite of a soldier after marching. Remember, also, that proper surrounding conditions are necessary—conditions which ward off the assaults of hurry and worry and all the brood of mental uneasiness.

#### DENTIST'S HEALTH

One of the greatest dangers to us dentists is that of tuberculosis. Statistics tell us that every seventh person has tuberculosis. Whether we are aware of the fact or not, the dentist operates every day in the mouths of those who are exhaling millions of tubercular bacilli, and try as we may, we are in a position to contract this, the most devastating of all diseases. I could not find statistics to show how many dentists have tuberculosis, but Dr. DeFord says: "The number must be large, for a few years ago I stepped off a train in Southern California, where the population of which, in this state, would have justified about twenty dentists, yet the discovery showed me over seventy-two!"

Many, many dentists have never seen a chancre or mucous patch in the mouth of a patient, but no dentist escapes for a single day operating in a field rich in tubercular bacilli. It becomes important, then, that we should exercise every precaution lest we become infected while working in the mouths of the tubercular patients. Remember that the lungs are not the only organ infected, but that tubercular deposits are found throughout the digestive tract, from the lips to the anus, and tuberculosis attacks every tissue and organ in the body. The gums, the lips, the cheeks, the hard and soft palate, the maxillary bones, the nares, the tonsils, the larynx, the pharynx, the uvula are subject to this condition, and the carious teeth and pyorrhea pockets teem with tubercular bacilli. See to it that no pellets of cotton used in these teeth are dropped on the floor, for these soon dry out, the moisture evaporating and filling the room.

The best authorities say that tuberculosis may be acquired as the result of arduous labor, mental or physical, taxing one's strength beyond all physical reason. The dentist who, early in the spring, knows that he is "all in," yet drags to his office each morning physically exhausted and under the whip, continues, perhaps by the use of drugs, to operate eight or ten hours a day until August, his usual vacation time, so weakens and enfeebles his constitution as to render himself a most excellent soil for the bacilli of tuberculosis, and his system is unable to combat the bacilli, the phagocytes are outnumbered, are routed by the victorious bacilli, and tuberculosis claims another victim.

#### TAKE A VACATION

Too many dentists are like an athlete who undertakes to run a mile at the pace of a fifty-yard dash, with the result that he is not only beaten by the man who knows the pace of the maximum efficiency, but he himself is soon a mental and physical wreck.

The best investment that many dentists make during the year is represented by the expense of their vacation. They are paying out money and earning nothing, but they are putting themselves in superb condition for greater work on their return. They are overhauling their physical and mental machinery, renewing, restoring, lubricating, polishing the delicate bearings and putting them in a condition to run smoothly and noiselessly for the balance of the year.

There is no investment which pays such great dividends as keeping one's physical condition up to the highest standard—upon this hangs our success and happiness.

The right kind of a vacation multiplies this power and effectiveness of the faculties; it increases courage, confidence and self-respect. Could there be a better investment? No, you do not need to be niggardly in the matter of your vacations. If you are, you will rob yourself of what you can never get back. Economize on anything else



but this. Whatever makes you a healthier, larger, more efficient man is cheap at any price you can stand. Whatever you do, whether you make money or lose it, succeed in your profession, keep up your physical and mental standards.

Supposing you do make a little more money or save a little more by omitting your vacation. Does this warrant your putting such a mortgage on your health efficiency, your capacity for work?

There are plenty of broken-down men in this country who would give half their fortunes if they could go back and take advantage of the bitter lesson they have learned from trying to get along without vacations.

#### CONCLUSION

No, the salt theory for "Living for Health" is not the panacea.

So long as men live to be one hundred years old or three score and ten, using common salt, so long as Mr. Fletcher's theory that nothing is good for our bodies unless pleasant to the taste goes undisputed, so long as thousands of children and adults are being poisoned each year by drugged and impure foods, so long as seventy five thousand people die each year from preventable diseases, so long as all our bodily diseases, such as mentioned in Mr. Harter's paper, have been and are being cured by Dr. Fletcher's theory, so long as we have the sin of overeating in our midst, so long as scientists do not possess a false modesty but are willing to come out in the open and declare that "salt is the medium of exchange in the system" and are willing to preach and defend their theories, so long as the blood shall require its large per cent of salt, so long as the God of the Universe commands the use of salt in our food, so long as caries of the teeth is preventable but not curable, and so long as I have a *stomach* and not a *craw*, I shall give my time and attention to these things and the salt theory can go glimmering.

May I, with apologies to little Willie, say in conclusion: .

Little Willie from his diet  
Stopped the use of common salt,  
Thinking, in his childish error,  
It would cure his system's faults.  
Before the funeral Willie's mother  
Sadly said to Mrs. Lynn:  
"Little Willie had lost his savor,  
Now putrefaction has set in."

The best things are nearest; breath in your nostrils, light in your eyes, flowers at your feet, duties at your hand, the path of God just before you. Then do not grasp at the stars, but do life's plain, common work as it comes, certain that daily duties and daily bread are the sweetest things of life.

—Robert Louis Stevenson.

## UNCLEAN MOUTH AND ITS EVIL RESULTS\*

By M. H. Fletcher, D.D.S., M.D., M.S., Cincinnati.

UNCLEANLINESS of the mouth is probably the indirect cause of more bodily disease than any other source. This fact has recently been forcibly set before us by such men as Hutchison, Turner, Lang, Hunter and others.

"Chronic ulcerative stomatitis," "putrid sore mouth," "fetid sore mouth," etc., as described in works on medicine, and as spoken of by physicians, are simply stages of a disease of the alveolar process and gums, popularly known as "receding gums," "sore," "spongy" or "bleeding gums." These conditions are preventable by proper daily cleanliness at the hands of the patient. They are caused by local irritants against the gums, calcareous deposits being by far the greatest factor. Any irritant, however, such as bands, rough edges of cavities and roots of teeth, rough fillings, splinters, or improper approximal spaces may be the exciting cause.

The various conditions or stages of the disease should be described under a name such as "Riggs' disease," or better still, "alveolitis." This allows of discussing the etiology, of giving the morbid anatomy in the various stages, and of describing the treatment of the various stages. These stages of what seems to be one disease are looked on by many as several distinct diseases, but the pathology and recovery both point plainly to one source.

Alveolitis is a disease of the bone which supports the teeth and involves the overlying gum-tissue, also the periosteum and peridental membranes. It results in the ultimate loss of the teeth by the destruction of the alveolar process. After the onset or initial lesion in the gums, and the alveolar process has become involved, the malady is primarily that of the bone, the soft, spongy and bleeding gums being a natural sequence. This is evidenced by the fact that the gum-tissues, although still inflamed, remain intact and nearly to their normal height long after deep pockets have been formed into the bone. The gums also promptly recover their normal health when the bone gets well or the tooth is removed. Again no amount of gum treatment, pure and simple, will cure the disease. In view of the above statements the following nomenclature has been adopted.

The disease may be described in all its phases by arbitrarily dividing it into stages, as follows:

- Initial or simple alveolitis.
- Non-suppurative alveolitis.
- Suppurative alveolitis.
- Necrotic alveolitis.
- Acute alveolitis.

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\*Read in the Section on Stomatology, A. M. A., of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Journal American Medical Association*.

Descriptive subdivisions are:

Chronic non-suppurative alveolitis.

Chronic suppurative alveolitis.

Necrotic non-suppurative alveolitis, which is always chronic.

Necrotic suppurative alveolitis, which is nearly always chronic but may be acute.

The subdivisions are merely descriptive of combined conditions. The suppurative and necrotic stages, both acute and chronic, display all the conditions described under the names, "chronic ulcerative stomatitis," "fetid stomatitis," "putrid sore mouth," "chronic stomatitis," etc. In sanitary conditions of the mouth undoubtedly encourage the propagation and virility of such microbes as are involved in aphtha, thrush, cancrum oris, and other bacterial diseases of the mucous membrane.

Gingivitis is always present to some degree in every stage of alveolitis and is very marked in the advanced stages. Its mildness or intensity is dependent on several things, such as the condition of the underlying bone, the character of the infection and the quantity and character of the calculus about the teeth. Mercury and other metallic poisonings intensify the symptoms as do auto-intoxications, scurvy and sordes.

#### INITIAL ALVEOLITIS

Initial alveolitis means the beginning of the disease in the gum-margin at the necks of the teeth. It usually starts from local irritants. These irritants cause wounds in the gum-tissues, which wounds are the doors of entrance (the infection atrium) of the infectious bacteria. All the irritants mentioned, excepting tartar, simply create the wound, which may be perpetuated by microbes. Tartar, however, never ceases to be deposited and is a continuous and progressive irritant, perpetuating the disease in its simple form.

Tartar is a normal constituent of saliva and is deposited in the protected places against the gums about the necks of the teeth. If undisturbed, it in due time becomes almost as hard as the tooth and very adherent to it. It is also rough and irritating to the gums. The pressure of tartar against the gums, be it soft or hard, will in time induce destruction of the mucous membrane. This creates an open wound at the point of contact, which will bleed on removal of the deposit. These wounds, be they ever so small, are the beginning, or initial lesion of the disease, resulting in the initial stage. This condition may be slowly progressive for many years without apparent infection. It is designated as simple alveolitis or chronic non-suppurative alveolitis, and is present, to some degree, in almost every human mouth and in the mouths of some domestic animals.

#### CHRONIC NON-SUPPURATIVE ALVEOLITIS

The unremitting effort of tissues to ward off disease may for years prevent a malignant infection of these wounds. With some persons it may be for a life-time, but the ultimate end of the disease, if the patient lives



long enough and the deposits are not removed, is the loss of the tooth. This process is as follows:

If tartar presses against the gums an open wound occurs and inflammation and swelling of the gum-tissue follows. This inflammation is indicative of an effort on the part of the tissues to dispose of a foreign body. Tartar cannot be thus disposed of because it is adherent to the teeth. The inflammation and swelling of the gum causes them to stand away from the tooth. This allows the saliva, freighted with calcareous material, to invade these spaces. Thus the deposit of tartar goes deeper and deeper, because the flesh recedes in order to get away from the irritant. This intended process of healing results in slow destruction of the alveolar process. The pockets thus become deeper and deeper until the bony support is entirely destroyed and the tooth is thrown off. During all this time the gums are more or less inflamed.

This simple or chronic non-suppurative form is so-called simply because the pus is not visible, and, as stated, is the most common of all forms. When, however, a malignant type of infection finds encouraging environment in one of these chronic non-suppurative wounds, it is most apt to be suppurative in type (staphylococcal or streptococcal). This is much more rapid in its destructive progress than the non-suppurative form. When suppuration exists in one place it is apt to be found in several places, and many times it is found in all the sockets. This condition constitutes suppurative alveolitis or so-called pyorrhea alveolaris.

#### SUPPURATIVE ALVEOLITIS OR PYORRHEA ALVEOLARIS

When pus is exuding from the sockets, it may be in such quantities that it is easily seen, or it may be easily pressed out with the fingers. On the other hand, it may be in such small quantities that it can be seen only with the aid of the microscope.

Once the suppurative type has begun, it may progress without the necessary presence of the original irritant or of calculus on the roots. A great many teeth are lost from this suppurative type of the disease. In consequence, the name "pyorrhea alveolaris" was originally given it, but this name indicates only one particular stage.

The absence of deposits on the roots of some of these teeth has led many authors to say that calculus or other local irritants have little or nothing to do with the disease. They say that it is systemic in its origin, that it is an accompaniment of the uric acid diathesis or a result of arteriosclerosis and its accompaniments. If, however, the complete history of alveolitis could be known, I believe, without doubt, that it would be found that the disease always starts with a local irritant and lesion. It is perpetuated by the continued presence of calculus, or of calculus and infection, or by other local irritants and infection, as above described. Those who say that the disease is caused by other than local irritants admit that these irritants must be thoroughly removed, and the pockets sterilized, or

the teeth removed, before the disease will disappear. The tartar or other irritants at the necks, which caused the initial lesion, may have been removed and thus unobserved. The tissues, however, may still be suppurative. It must be remembered that there can be no lesion without a cause, and no infection without a lesion. Tartar is one of the greatest causes of these lesions and pus germs almost the universal infection.

The most frequent result of this suppurative infection, in addition to highly inflamed gums, is destruction of considerable zones of bone. This is especially true in the septa between the teeth and in the cancellous bone deeper in the alveolar process and the maxillæ. This condition is often comparable to osteomyelitis or tuberculous bone. It results in the death and destruction of much bone about and beyond the sockets of the teeth, and is known as necrotic alveolitis.

#### NECROTIC ALVEOLITIS

When the cancellous bone about or beyond the roots is reached any germs capable of living in such environment not only find Nature less capable of resisting their progress, but they find greater protection and more favorable conditions for rapid multiplication; consequently, considerable zones of bone die. This necrotic bone now becomes an additional object of care to the elements of protection and repair. Because the deposits still adhere to the roots, or because microbes are too plentiful to be entirely destroyed, Nature cannot accomplish the object of repair without assistance. She never ceases her efforts, however, until she disposes of the tooth, irritants and all. Then the army of repair soon heals the wounds. In this stage of disease, calculus is often found about the apices, especially of the upper molars. Under these conditions the antrum is frequently penetrated, which often means empyema of this cavity. This penetration of the antrum is most apt to be between the first and second molars, but it is often between the second and third. The bone about all the teeth in the locality is more or less involved.

Deep-seated necrotic cases in the lower jaw sometimes result in the necessity of removing quite a portion of either the outer or inner plate of the jaw, and the loss of one or more teeth. In fact, the ravages of the disease may not stop short of the necessity of removing considerable portions of the jaw-bone.

In some instances, in both the lower and the upper jaw, quite large necrotic zones are found in the bone about, between or beyond the teeth. These cavities are often not associated with pus, but are of a "dry" necrotic or carious character; they are not usually accessible without drilling or curetting into them. The symptoms leading to their existence are usually pain of a neuralgic or *lie douloureux* character. The existence of these cavities is not commonly known, the pain usually being attributed to neuritis or possibly to *lie douloureux*. The treatment given in these instances is usually systemic for neuritis, instead of surgical for diseased

periosteum and bone. Consequently the patient often suffers for many years without relief. Removal of the teeth involved usually gives entire relief in time. Healing may be induced, however, by curetting or burring out the diseased bone, sterilizing the cavities, and persisting in the treatment until recovery takes place. The *tie douloureux* features, which seem to involve the periosteum, would require a special paper to describe them; hence they will not now be discussed.

#### ACUTE AND CHRONIC ALVEOLITIS

The adjectives acute and chronic are applied to the various stages of alveolitis according as conditions demand, as is done in other surgical diseases.

#### MANUAL TREATMENT

While there is probably no disease of mankind so prevalent as alveolitis, there is likely no disease so amenable to treatment. This treatment is largely local and manual. Neither is there any disease more surely preventable. Prevention is a question of keeping the mouth clean and the teeth free from tartar and other irritants about their necks. This is a matter of mechanical cleaning, not medicinal. If the cause of the lesions is prevented, infection cannot enter and sterilizing medicines are not needed. Stomatologists and many dentists are now engaged in the successful treatment of alveolitis and in teaching their patients how to prevent it.

The whole of the operative treatment consists in removing all deposits or other irritants from the roots and necks of the teeth. This must be followed by sterilizing these surfaces, removing the dead and diseased bone in and about the sockets, sterilizing the sockets and cavities of bone, and keeping them thus sterilized until recovery is complete.

The preventive treatment is the patient's work. He needs instruction from the physician how to do it, however, since the ordinary way of "scrubbing the teeth" falls far short of reaching the object. In my hands it requires from three to six months for patients properly to learn the process of cleaning. It is the most important feature of the whole subject and the only practical method of prevention. Patients can and do learn it, however, and in consequence have mouths pure and free from disease, which is a large factor of insurance against many systemic maladies. Patients may have to return two or three times a year to have places cleaned which they cannot easily reach. But they can and do learn the preventive treatment.

The greatest shortcoming, in treating the disease, is the lack of thoroughness on the part of the stomatologist. He often fails to remove the deep-seated deposits near the apices of the roots and the dead bone beyond. To do this properly requires a touch trained to distinguish between deposit and the tooth surface, and between live and dead bone. It also requires skill and conscious effort coupled with a knowledge of the anatomy and



pathology. Thus only can the work be properly done. This operative procedure must be followed by suitable methods of sterilizing the wounds. In but few cases is it practicable to remove all dead and diseased bone and all infection. If, however, a sufficient amount be removed, Nature will be able to throw a large enough army of repair about the wound to destroy the remaining bacteria and remove the dead bone. She then rebuilds the destroyed tissue as far as possible.

My own practice, in sterilizing these pockets, is to use pure tincture of iodine, 75 per cent lactic acid or crystals of argyrol. Many other remedies may be equally good, but each physician must select his own, keeping in mind the object to be accomplished. A long curved hypodermic needle, and cotton wound on a "twist broach" have in my hands permitted the medication of any case yet presented. I have devised and had manufactured a set of currettes and engine burs for removing dead and diseased bone. The burs are usually more efficient and less painful. The "plane-bit" type of the cleaners, however, is sufficient in most cases, being used also as currettes.

#### PREVENTIVE TREATMENT

The dental profession of today is doing great good in promulgating and teaching the value of oral hygiene. After mouth examinations in schools, lectures and demonstrations are given to the children, teachers and mothers on the prevention of disease by mouth cleanliness. The results of this work show, not only improvement in general health, but also greatly increased mental capacity in the children.

The condition of the mouth, in both adults and children, should receive much more careful attention from surgeons and physicians than it ever has. This is especially needful, since oral sepsis is now known to be the source of many diseases. Numbers of these are surely preventable by mouth cleanliness. Insurance companies are beginning to recognize this fact.

The so-called prophylactic treatment, as practiced by the dentists of today, is really the surgical treatment of the disease, since it is the removal of the exciting and secondary causes.

In the initial and non-suppurative stages of alveolitis, simply removing the tartar—cleaning the teeth—enables the wounds to heal. This is all the treatment a large majority of cases receive at the hands of most dentists, and all they need. But it is most desirable to know the whole pathology and treatment of the extreme cases as well as the simple ones.

The disease tends strongly to return if preventive treatment is neglected by the patient. That which brought on the disease, namely, the lime salts in the saliva, is always present to bring it back. Tartar, when first deposited, is soft, like partly dissolved soap, and is easily removed. Inside of forty-eight hours the film next to the tooth begins to harden and

is then removed with much difficulty. Hence comes the necessity of thoroughly cleaning the mouth and teeth at least once a day, with brush, powder, picks and floss.

#### RECOVERY

It should be borne in mind that, after the initial stage, alveolitis is a bone disease and should be treated as such. It takes the bone and periosteum of the jaws as long to repair as it does like tissues elsewhere; the cementum requires a longer time for repair than does bone.

In the deep-seated cases the difficulties of removing all calculus and infection are such that a number of sittings, a week or two apart, may be necessary to remove them. Healing begins immediately after the first treatment. The usual time required for regeneration of the bone and periosteum, however, must be allowed before we can expect recovery. Therefore great patience is necessary on the part of both patient and physician. Three months is the shortest time in which one could reasonably expect good results. A period of six months, a year or more often elapses before recovery is satisfactory. During this time the patient will need the physician's assistance once a week, or two or more weeks apart, according to symptoms.

#### SYSTEMIC FEATURES

Alveolitis, like all other diseases, has its nervous phase. This results in discomfort, pain, or total disability, according to the complications and intensity of the disease.

Alveolitis is encouraged by auto-intoxications and by the numerous manifestations accompanying them, such as gout, uric acid disorders, arteriosclerosis, etc. These diseases are in turn encouraged by alveolitis; thus the vicious circle is established. I know of no systemic pathologic conditions, however, which could cause the almost universal presence of alveolitis, but local irritants are universally present.

We all know that alveolitis recovers without systemic treatment, but such treatment often materially assists in recovery. During systemic disorders, any weakened organ or point of least resistance, such as "sore gums," becomes easily inflamed and acute. That particular local feature is thus intensified. If, therefore, systemic disorders are manifest and serious, they should have attention at the hands of the operator or the family physician. On the other hand, I believe that alveolitis not only is of local origin but also, in its suppurative and necrotic stages, is a great predisposing factor to, and is the cause of, many bodily diseases, such as pernicious anemia, disorders of the alimentary tract, nervous derangement, etc. The mouth as a source of septic poisoning and the cause of many diseases has recently attracted the attention of acute diagnosticians.

Dr. William Hunter, of London, has put the dangers of oral sepsis plainly before us. I strongly recommend his papers to anyone who is interested in the subject. In closing I wish to quote some paragraphs from him

which will help to establish the idea that alveolitis is of local origin, and that it is the cause of many bodily diseases, instead of its being the result of such diseases.<sup>1</sup>

In the foregoing sketch of the chief sphere of the doctor's work and interest, I omitted any reference to one other portion of the body which constantly comes under the observation, indeed more often than any other—I mean the mouth. This omission was intentional on my part. The cases presently to be described—which could be multiplied by thousands and tens of thousands coming under the daily notice of doctors—illustrate how constant the omission is in practice. . . .

What I desire to impress on you students, and all students entering the profession, and all those already engaged in the practice of the profession is, it is “not a matter of teeth and dentistry.” It is an all-important matter of sepsis and anti-sepsis that concerns every branch of the medical profession and concerns very closely the public health of the community. It is not simply a matter of “neglect of the teeth” by the patient, as is so commonly stated, but one of neglect of a great infection by the profession—a great infective disease for which the patient is not primarily responsible any more than he is responsible for the contraction of typhoid fever or tuberculosis. The condition referred to is that to which I have given the name of “oral sepsis.” . . .

The chief feature of this particular oral sepsis is that the whole of it is swallowed or absorbed into the lymphatics and blood. Unlike the sepsis of open wounds on the outside of the body, none of it is got rid of by free discharge on the surface. The effects of it, therefore, fall, in the first place, on the whole of the alimentary tract from the tonsils downward. These effects include every degree and variety of tonsilitis and pharyngitis, of gastric trouble, from functional dyspepsia to gastritis and gastric ulcer, and every degree and variety of enteritis and colitis and troubles in adjacent parts, e. g., appendicitis. The effects fall, in the second place, on the glands (adenitis), on the blood (septic anemia, puerperal fever, septicemia), on the joints (arthritis), on the kidneys (nephritis), and on the nervous system. . . .

The title “oral sepsis” was first introduced into medical literature in a paper entitled “Oral Sepsis as a Cause of Disease.” My object in seeking for a special name, and, after consideration, in creating this one, was to emphasize the great fact that it is not the absence of teeth, but the presence of sepsis; that it is not dental effects, but septic effects; that it is not defective mastication, but the affective sepsis associated with such dental defects often present, in conditions of gingivitis apart from such dental defects, that are responsible for the ill health associated with “bad” mouths. . . .

The subject of oral sepsis, as I designated and defined it, namely, the septic lesions of streptococcal and staphylococcal infection found in the mouth, belongs to no one department of medicine or surgery. It is common ground on which the general physician or surgeon, the throat, nose and ear and eye specialist, specialists in children's diseases, in stomach diseases, in blood diseases, in “rheumatic” diseases, in fevers, in skin disease, in nervous and mental disease, and lastly the dental surgeon, all meet on terms of equal responsibility. In its earliest manifestations, no special knowledge is required to deal with it; a sound grasp of the principles underlying antiseptics alone is required. Unfortunately for the patient, it is precisely this grasp which I grieve to say is wanting. . . .

For this is what the practitioners are constantly doing. Wherein consists the pathologic difference between a follicular tonsilitis and a foul, septic, suppurating condition of the gums, with deposition of calcareous “crusts and scabs” (so-called tartar) covering and hiding septic wounds and ulcers, loaded, as microscopic examination shows, with staphylococci and streptococci? None whatever, except that the latter is exceedingly common and the tonsilitis is comparatively rare. The pathologic con-

1. Hunter, W.: *Rôle of Sepsis and of Antiseptics in Medicine*, an address delivered at the opening session of the Faculty of McGill University, Montreal, Oct. 3, 1910.



dition in both is the same, namely, sepsis. Moreover, it is sepsis as easily recognized and much of it as easily removed in the case of the one as in the other.

Even if the teeth are not subject to a very marked septic infective process, the infective processes in the gums constitute very important septic wounds, and are a great source of sepsis to the body. As a matter of experience this is often the case. The teeth remain intact, or at least free from obvious caries or carionecrosis, but the gums and the periosteum of the sockets are the seat of numerous septic wounds. These are shown by septic suppuration, by deposits of tartar sometimes in great masses on the teeth, on the gum-margin and beneath the gum-margins, by the formation of pockets (septic ulceration of the periosteum—periostitis), absorption of bone, and loosening of the teeth in their sockets. . . .

I submit, then, once more, as I did in the first communication (1900) bearing the title of "Oral Sepsis," that in the interests of the many sufferers from the great group of medical affections which it produces, this condition of oral sepsis, the chief channel of access of all pyogenic affections, is urgently deserving of increased notice and attention. Knowing, as we do, the pathogenic qualities of staphylococci and streptococci, we have not the slightest excuse for allowing the mouth, so easily accessible to local measures, to remain their chief seat, and its open wounds a veritable hotbed for their development and propagation.

11 East Seventh Street.

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### WANTED: A SENSE OF ASEPSIS\*

By John S. Marshall, M.D., Sc.D., Berkeley, Cal.

Captain, U. S. Army, Retired.

**H**AVE WE, as practitioners of an important specialty of the healing art, a proper sense of asepsis? If a just opinion can be formed from observing the clinical teaching in our dental colleges, the methods employed in the offices of nearly all classes of dental practitioners and the demonstrations at the clinics of our state and national societies, then we must admit that we fall far short of a proper sense of asepsis.

What is asepsis? Asepsis from the surgical standpoint is that condition, maintained during the operation or treatment and the after process of healing or cure, which is the result of any process or method rendering the tissues to be operated on, the hands of the operators, the instruments, dressings, fluids, medicaments and ligatures, which come in contact with them, *germ-free*, and maintaining this condition during the operation or treatment and the after-process of healing or cure.

It would be manifestly unjust to say that dental practitioners as a class are ignorant of the principles that underlie asepsis. That these principles are taught in the lecture-rooms of most of our dental colleges there is no doubt; but this teaching is then practically ignored by a very large majority of the students in their clinical work in the infirmaries. This is due in part to the fact that the clinic-rooms are poorly equipped with sterilizing apparatus and that the teachers, demonstrators and professors who oversee and direct the operations of the students are often exceedingly

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\*Read in the Section on Stomatology, A. M. A., of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Journal American Medical Association*.

lax in their own technic and do not insist on a faithful carrying out of the didactic teaching on this subject. I have been astonished, yes, appalled, at the utter disregard of all modern, scientific methods of asepsis to be found in many of our dental colleges, in the offices of numerous dental practitioners and particularly at the clinics of our state and national societies.

Let me particularize as to some of the things that I have seen in the infirmaries of our dental colleges:

1. In one college there were only two sterilizers in the operating-room and one in the extracting-room for the use of more than fifty students. It needs no extensive calculation to prove that this provision for sterilization was entirely inadequate, and as a result the majority of the students contented themselves with simply wiping their instruments on a towel, often a soiled one, before passing to the next patient, rather than wait for their turn at the sterilizers. Furthermore, I have seen nerve broaches that had been used in septic pulp-canals tossed back into the box without sterilization and used again on a patient without even being dipped in phenol (carbolic acid) or other sterilizing fluid. One towel was made to do duty for an entire clinical period lasting from two to three hours and sometimes for two to three patients. Demonstrators frequently passed from one patient to another, examining and criticizing the work of the students, but never thinking it necessary to even wash their hands before placing their fingers in the mouth of the next patient. But worst of all, I have seen a prominent teacher pass through his operating-room with a mouth-mirror in a waistcoat pocket, examining the work of his students and going from chair to chair without once washing his hands or cleansing the mouth-mirror. Verily we do need "a sense of asepsis" and in this case something more.

2. I have visited the offices of many dental practitioners in which there was no provision for sterilizing instruments, and the only cleansing that I saw these instruments receive was a simple washing in warm water. I have been invited to examine a case, and after carefully washing my hands and sterilizing them with alcohol, have been offered a soiled towel to dry them with.

An office may be fitted up in the most elaborate manner with enameled furniture, marble floors and wainscoting and zinc painted walls, but this will prove of no value if the more important matters of local and personal asepsis are neglected or ignored. The charge, often made by physicians, and doubtless true, that infectious diseases such as tonsillitis, diphtheria, tuberculosis and syphilis have been frequently transmitted from one patient to another by unclean and septic dental instruments is a shame and a reproach to modern dentistry, and shows the need of a "proper sense of asepsis."

3. I have witnessed at the public clinics given by various state societies and at the clinics of the National Dental Association the same disregard of aseptic methods as those already mentioned. In fact, the one

thing most prominently and indelibly impressed on my mind at the last meeting of the National Association was the reckless disregard of asepsis in many of the clinics, both by the operator himself and those that he permitted to inspect the progressive steps of his operation and its completion. Twice in my professional life I have been a patient at the clinics of the National Dental Association, and I therefore speak with authority and much feeling when I say that I looked with fear and trembling at the dirty fingers thrust into my mouth by the interested spectators. But never more. Personally I have always declined to operate at one of these public clinics for the reason that the facilities for aseptic operations were so meager or absolutely wanting that I dared not risk the health or life of the patient, or my own reputation.

In my work as an examiner of dental surgeons for appointment to the dental corps of the U. S. Army, I have found a lamentable lack of a proper sense of asepsis, and many young men have failed in their practical tests by reason of this fact.

I have always considered it my duty to draw the line very sharply on the question of a proper sense of asepsis, for the reason that great harm may result from uncleanly methods of operating. The remedy for such methods lies with the teachers in our dental schools and with the clinicians at our state and national associations. When teachers of prominence and clinicians of high standing in the profession are indifferent to, or ignorant of, the principles of asepsis, it cannot be expected that the students and young practitioners will be impressed with its value or see the necessity for such painstaking and elaborate preparations to prevent infection. The fact that infection does not always take place when aseptic methods are ignored is no assurance that it will not take place in any case. Resistance to disease is not equal in all individuals, and the virulence of infective organisms is not always the same. Untold suffering and many deaths have been the result of neglect and ignorance of a proper sense of asepsis.

Much of the trouble experienced by so many dentists in the treatment of septic conditions of the teeth and mouth is the result of an imperfect knowledge of the principles of asepsis and a worse than bad technic.

I know a physician who left the chair of a dentist of high reputation because of his fear of infection on observing the unscientific technic practiced by the dentist. The public generally is also becoming educated along these lines, and many individuals will not expose themselves to such grave dangers from infection at the hands of a careless or ignorant dentist or surgeon.

Is it not time that this question of asepsis in all dental operations should be taken up in a serious manner and that its principles be taught and the technic practiced in the most careful and scientific manner?

There is no longer any excuse for lax methods in asepsis, and the sooner the profession awakes to the fact the better it will be for the reputation of the profession and the health of the public. *Wanted: a sense of asepsis.*



## ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. FLETCHER AND MARSHALL

DR. VIDA A. LATHAM, Chicago: These papers show again that we need our laboratories; that we need wise teachers; and also that we must be weak somewhere that it takes twelve or fifteen years before the medical profession, including dentistry, to discover Hunter's work on oral sepsis. The paper read by Dr. Hunter has been lying dormant until some factor brought it out. Was it the attack on American dentistry in regard to bad bridgework which caused such a furor, or was it the fact that Americans did not like the idea that that came from this side? This paper that has been quoted from was a paper on diseases of the blood, inspired by a paper which Byron Bromwell wrote on anemia, in which he said that there was a peculiar condition of the blood in anemia that nobody seemed to grasp. Dr. Brown presented that subject to us and gave a number of lantern slides, and the question was put to us, what was it that caused this peculiar condition of the blood? That means that it comes very near our field of work, and is very far-reaching in its effects; that it is not only in the mouth, but in the abdominal viscera, the liver, the spleen, kidney, etc., proving that sepsis from streptococcus infection was all through every organ. Dr. Hunter wrote as far back as 1900 on acute kidney sepsis due to streptococcus infection. If you remember, I made mention of this at the Portland meeting, and the suggestions made by this Section were put into effect in the Indian jails and the percentage of dysentery was lessened more than 50 per cent by oral hygiene. It would look to me as though we need postgraduate work in this line, as only a few of the journals have made any mention of this subject, and that only in three or four, which are simply rehashes of what we already know.

DR. A. J. FLANAGAN, Springfield, Mass.: Of course, some here present know that in the minds of fully 90 per cent of the people in America, who are having dentistry done today, the great thought as they enter the dental office is this, that they are paying for a material, and that the fee that is to be collected is usually computed on account of something material which they have received. In medicine and surgery that does not enter into consideration. People think today, when they go to physician or surgeon, that they are to pay for the knowledge and the ability of the operator, and the dangerous condition of the operation, and many other things which we have not the time to mention. Now, if 90 per cent of the people can be educated to understand that dentistry is a part of the healing art, the great problem of sepsis in the average dental practice will have been solved. It is an economic question because of the condition that exists in the minds of the people. Now, what are we to do about it? I would like to ask Dr. Fletcher, or any man here, if the tooth which has lost two-thirds of its hold in the jaw is the equal of one which has its three-thirds. In proportion as we lose a proportion of that hold in the jaw, in that proportion do we lose a certain usefulness of that tooth. If we take into consideration the stress and the fact that there is going to be decay of the tooth, and the liability of the tooth to disease and all that, we need to recognize the fact that the tooth can never be retained in the mouth without some method of increasing or bringing back the hold which has been lost. Has any man ever been able to re-create pericemental tissue? Many young men are led astray by the idea that we can re-create that two-thirds or half of the attachment of the pericemental tissue.

DR. M. L. RHEIN, New York: The hygienic preservation of the mouth with the septic foci left in the mouth is, of course, to us an absurdity, and yet a careful investigation of what 90 per cent of the dentists of this country consider this sort of treatment will show just such a condition of affairs. I am a very earnest advocate of mouth cleanliness among the poorest classes of children. I believe that if dental dispensary service to poor children were confined to this one feature much more benefit would ultimately accrue than by the use of questionable methods of dental repair and construction.

I have seen much harm perpetrated and damage done to the human body by makeshift or cheap constructive dental service; nothing has tended more to produce unhygienic conditions. Operative dentistry in its true sense is more or less of a luxury; it is impossible to make it a necessity. We can teach oral hygiene in its real and true sense; but when it comes to the repair of the ravages of dental disease, anything that falls short of what should be done should be criticized as malpractice. It is not a benefit; it is a curse. That is the true picture of dentistry as performed by the mass of dentists for the people who cannot afford to pay for dentistry properly performed. The excuse that these dentists give for that kind of malpractice is that it is impossible for them to provide the proper kind of dentistry and earn a livelihood. My point has always been in this matter that the people who cannot afford to pay for the preservation of the tooth so that it shall be preserved in an aseptic condition from further possible infection hereafter, would be far better off if they never had anything done to that individual tooth. It remains for a Section like this to establish some form of education that will bring the practice of stomatology out of such a condition. The one way is to make the general medical man understand what aseptic dentistry means and to be able to distinguish the difference between aseptic dentistry and septic dentistry. When the physician understands that dentistry is taking away years of the life of that patient by the septic methods of work pursued, he is going to protest against that thing just the same as he would protest against some form of maltreatment of the patient's ears or eyes, or any other part of the body.

DR. E. S. TALBOT, Chicago: The first part of Dr. Fletcher's paper is rather labored. Dividing up the different degrees of the disease does not appeal to me as being a point well taken. If we understood more clearly the nature of the structures under discussion we would be better able to grasp the pathology and be much more clear, I think, in the aggregate. If we understood that the alveolar process is a transitory structure; that it is simply there for the purpose of holding the teeth in place, and when disease attacks the alveolar process, or a tooth is extracted, it is natural for that process to be destroyed, then we would more readily understand the nature of the disease that attacks the gum-margin. Again, the alveolar process is an end-organ, and end-organs are more easily involved in disease than any other structure of the human body. So that having an exceedingly sensitive structure, a double transitory structure and an end-organ, when disease once attacks the gum margins it becomes chronic and the tissue is very rarely restored to health. In lower vertebrates we have continuous sets of teeth: they come and go throughout the life of the individual, and as we ascend in the scale up to man, and some of the lower vertebrates, we have only two sets of teeth, and all of the vertebrates that have only two sets of teeth have what I call interstitial gingivitis. Animals in captivity, cows and horses, if fed on food that is not natural, or animals put in cages and forced to live unnatural lives, have this disease, because the teeth are only intended for a short period of time. The first teeth come into place and are lost, the second come into place to remain only a short time. As soon as man or animal get their growth, the alveolar process begins to absorb away to shed the teeth. It is an atavism, and so this inflammation is not easy to treat. If the individual has any disease, if his system is out of order, if his blood is in poor condition, and he has a local irritation about the teeth, that irritation affects these transitory structures and end-organs, and as the result sooner or later they lose their function and the teeth drop out. In 1886 I read a paper (I think in the *Cosmos*), making the statement that dentistry was producing more disease of the gums than any other one thing, and I have worked on that line for forty years. The principle of saving teeth is wrong. Every time we put the rubber dam or a clamp on a tooth, or wedge the teeth apart for the purpose of filling, or injure the gum-margin with an instrument, we set up an irritation that eventually, whenever the system is out of order, that is to say, when the blood is not perfectly pure, will affect the alveolar process. If we cannot treat a tooth and save it without irritating the alveolar process and the gum-margin, it is much better to remove that tooth; it is a quicker way of getting rid of it and the patient would

have a healthier mouth than he could possibly have under our present methods of operation.

DR. W. C. FISHER, New York: The appurtenances provided at most dental meetings for giving clinics certainly are deplorable, and everything that Dr. Marshall has said is true in more than nine out of ten state and national meetings. I agree most decidedly with Dr. Talbot that many of these cases are extremely difficult to treat. I frequently have skiagraphs taken of the patient almost immediately on presentation for treatment in order to learn if there is anything to prevent a cure, and if I am convinced that there is, I do not hesitate to remove the tooth. In referring to the character of bridgework, and the unclean mouths that result from the character of work done by 90 per cent of dentists today, I do not blame the dentist, but I blame the patient for going to the man who is doing the kind of dentistry that is done today in the dental school and in the public clinic. I am not inclined to think that 90 per cent of American dentists have been so careless as they have been pictured. There are more than 10 per cent, I believe, who do good work and do not do patients harm.

DR. M. I. SCHAMBERG, New York: I would like to emphasize further the point brought out by Dr. Talbot in connection with the fact that the gingival border of the gum tissue might be properly styled an end-organ, and that that portion is more susceptible to disease during conditions of poor peripheral circulation than other parts. We might take as an analogy the drying up of a leaf, the manner in which it dries up on the edge as a rule more particularly than in the center and the manner in which the majority of fruit rots or decays at the point of a bruise. There is a tremendous amount of harm done through the bruising of the margin of the gum, whether it is done by improper brushing of the teeth, poor dental work, or the impaction of food in the interdental spaces. These are the exciting causes of pyorrhea. Dr. Flanagan's question, "Is there a man who can restore lost tissue?" must necessarily be answered in the negative. I have had several very severe cases during the past winter in which there appeared to be a gum flap lying over the tooth, with no tendency toward attachment at any point. I snipped that off with scissors, in some cases exposing the tooth almost down to the apex. It is astonishing in many of these cases the amount of firmness that is regained after the source of irritation and accumulation of filth has been removed. I believe that the tooth, even though it be exposed for one-third the length of the root, might be retained, as many temporary teeth are at times retained, and remain very firm with practically no root remaining, as is frequently noticed.

DR. H. S. HASLETT, Pittsburgh: The statement was made a moment ago that the fault of poor dentistry lies with the teaching in the colleges. The fault lies more with the following out of the teaching after the student gets into practice himself. We find in many instances that young men going into practice will neglect the most intricate part of their work, will forget technic, and take short cuts across lots in order to reach a conclusion rather than to go by the beaten path through which they were led during their college course. Not more than three weeks ago a young man who had been in practice for three years, brought a piece of bridgework to me and asked me to criticise it, and he walked out of the office because I said he was never taught to make a bridge such as that, and that as soon as he could forget this kind of work, just so soon would he begin to progress in the profession and not until then. That was the case of a young man who had been in practice a short time. Last week a student just finishing his freshman course came to me to ask if he had failed. I told him that he had; and he said, "I believe that dentistry is a big graft game, and I am sorry that I cannot go on." "If that is the way you feel," I said, "now is the best time to get out; we do not want you, if you feel that dentistry is a graft." What would you expect of that man if he went on? How would he prepare cavities, how would he fill teeth, how would he treat any conditions that he came in contact with, with that idea of graft before him? Now, we do not teach graft; we teach dentistry, and if they become grafters after that, it is not the fault of the college, but the fault of the student.



DR. M. H. FLETCHER, Cincinnati: In answer to Dr. Flanagan, I do not think that the physiological repair of tissues can be measured by halves or quarters. One tissue may repair more than another, and I believe with Dr. Fisher, that when there is nothing left that will bring about repair, that the teeth should be removed for the purpose of asepsis. Nevertheless, after careful study of the conditions, if I can distinguish any healthy tissue left in the socket of the tooth, it is worth an effort to try and save that tooth. I have seen many cases in which teeth have become useful regardless of stress. I can show any number of radiographs taken one, two or three years after the case had been in hand in which there has been repair. An artificial substitute of itself would be more or less a continual cause for sepsis. How many people who have removable pieces in their mouths keep them as clean as they should be? Now, it is up to us to know enough about the laws of physiology of repair and about pathology to be able to distinguish these conditions when we see them. If the doctor's degree does not give that knowledge, what is the degree for? I object to Dr. Talbot's use of the term "end-organ." His condemnation of the alveolar process, saying that it is transitory, does not mean to me what it does to him, for in an animal which has progressively growing teeth, the alveolar process is continually reforming as long as that animal has that tooth, and as long as it lives. Why does that animal not have this disease around the teeth? Look at the ruminants; there is a hard tissue developed around their teeth, which when wounded heals as the skin would heal. It heals because of the physiologic principle for the organism to repair itself. That is the law of repair and growth, and it cannot be changed no matter what we think or try to do. It is my endeavor to teach every patient, and I tell them that they cannot be my patient if they do not want to learn this. What I undertake to do is to replace with the tooth-brush in the hands of the patient everything that creates healthy gums and healthy connective tissue around the necks of the teeth. I do not see any difference between the method of repair of the tissues around the alveolar process and that in any other part of the body. The cementum will repair itself to a certain degree. They have originally the same process of forming bone. As far as the transitory conditions are concerned, I do not see any difference excepting in environment, which brings about the necessity for the animal to shed the teeth. Take the pachyderms, the elephants; elephant's teeth are continually shedding—until the time of death, as far as I know—and the physiologic process of building bone around each tooth is a natural histologic process in consequence of the demand of the animal for the teeth. The alveolar process is found in all ruminants, and the process is perfectly normal as far as I see.

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## AN INLAY FOR COMPOUND CAVITY INVOLVING INCISAL WITHOUT STEP.\*

By H. C. Dean, D.D.S., Columbus, Ohio.

It is often desired to place a gold inlay involving the approximal side and incisal edge, without sacrificing the sound structure of the tooth to make a step. This may be done by placing an iridio-platinum post near the incisal after the inlay has been completed. Inlay should have a wide, deep groove carved in the approximal surface extending from near the incisal to the gingival. This should be done in the wax model. This groove is to pass over the iridio-platinum post, when the inlay may be set from the incisal without interference from an approximating tooth. There may be an extension of this iridio-platinum post for additional retention in

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\*Clinic Ohio State Dental Society.

the groove of the inlay. Since the inlay model is completed before the incisal retention post is provided, there is absolutely no interference with the removal of the model. The retention post fits loosely in the tooth and in the inlay until cemented. Post and inlay are both set with same mix of cement.

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## THE USE OF THE MATRIX FOR FILLING BICUSPIDS AND MOLARS.\*

By Oscar Miesse, D. D. S., Columbus, Ohio.

This clinic is given in order to show the contour, accuracy and ease of making fillings between bicuspid and molar teeth. And of restoring broken-down walls and natural points of contact between teeth, also of preventing filling materials from passing under the cervex, thus preventing irritation at the cervical margins, and also shrinking of the gum tissue. The appliances I use are Ivory's and the Anderdonk matrix clamp. They are easily adjusted and also easily removed, and by coating them (the bands) slightly with vaseline, even contoured cement fillings are easily placed. In my clinic I simply showed results obtained by the use of the matrix, also the manner of placing same on the teeth.

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\*Clinic Ohio State Dental Society.

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## OCCLUSION AND ITS GOVERNING FORCES\*

By Edward L. Mitchell, D. D. S., Indianapolis, Ind.

THERE is no claim of originality for the fundamental thoughts of this paper, but I merely wish to emphasize a few ideas of other men which certainly should be prevalent in the mind of each and every practitioner.

"Occlusion is the normal relation of the occlusal incline planes of the teeth when the jaws are closed. Mal-occlusion is any deviation from the normal." (Angle.)

Forces of occlusion are those which influence the development, eruption and position of the teeth, as well as the co-relation of the jaws themselves. With a proper distribution of these forces the teeth are forced to occupy and afterward retain their normal position. But, where a mal-occlusion is once established by their improper distribution, the whole tendency is toward the abnormal.

In considering the correlative parts of a human denture, let us mention the jaws and arches, alveolar process, muscles of the lips, cheeks and tongue, the mouth, nasal passages, pharynx, palate and throat.

The jaws of a child at birth, in a large percentage of cases, unless there has been some congenital disturbance, bear the proper relation, one to the other, and to the rest of the face and head. Then, as a natural con-

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\*Read at Northern Indiana Dental Society.

sequence, there being nothing to interfere with the eruption of the temporary teeth, they are prone to occupy a position conducive to harmony and beauty in the developing child's face.

The first permanent molars develop independently of any other teeth, as do all of the deciduous ones. This being true, there is nothing to molest their normal eruption; also being guided by the deciduous teeth already in place, they are more constant, both as to position and time of eruption, than any other tooth in the permanent set. These teeth are the most important, aside from the temporary ones, for several reasons. They are the first permanent teeth to erupt and, as before stated, the most constant both as to position and time of eruption. They are the largest, most highly specialized and firmest in their attachment. They occupy a position in the arch, making them a most powerful factor in mastication. They determine the length of the bite, support the jaws and, in a way, exert a parental influence over the deciduous teeth by taking the strain of mastication off of them while their roots are absorbing, and holding the mesio-distal relation of the jaws while the other teeth are erupting.

Just at this age the cusps of the temporary molars are often abraded, or perhaps there is more or less loss of tooth structure from caries, thus destroying their locking power; hence, their function in maintaining the proper relation of the jaws. Then it is that the first permanent molar, so little appreciated, condescends to appear and bear, practically, all of the burden alone. Their cusps are longer than any of the other teeth, which is a great factor in guiding them to their normal positions, afterward maintaining the same, and finally acting as a guide to all of the permanent teeth which are to follow.

If the first molars lock abnormally and a malocclusion is established, the harmony in size of the arches is interfered with just in proportion to the malposition of these teeth. This condition, when once established, is very progressive, and if let alone will hasten from a slight abnormality at first to a hideous deformity in the end. A malocclusion of this kind will positively never correct itself, but will, in all cases, be more or less progressive unless there is interference from a source other than Nature herself.

So we see that if there is any interference with the forces of occlusion just then they become more powerful factors in causing a malocclusion than they possibly could be in preserving the normal.

When all is working as Nature intended, the roots of the temporary teeth absorb as the succedaneous ones slowly force themselves into their erupting positions. Along with the roots the osteoclasts also absorb the alveolar process which surrounds the temporary teeth, then as the permanent teeth erupt new process is built up around them. If for any reason Nature fails to take care of the absorption of these roots, and the teeth must be extracted, the alveolar process has not been absorbed, thus leaving a stumbling block for the erupting teeth.



If the process has been slightly fractured the tooth will come through at the point of the least resistance and many times be forced to occupy a position abnormal to its own. The permanency of this position depends largely upon the teeth of the opposing jaw.

The teeth not only influence all the approximating ones in the same jaw, but one jaw has a very important action in moulding those of the other. We know that the lower teeth precede those of the upper jaw, therefore, I will say, if the incisors of the mandible erupt normally the six-year molars are in normal occlusion, and there is no mutilation, all will come well. If, however, one of the incisors in the lower arch erupts in labial or lingual occlusion, we have a malocclusion established and, as the lips act upon the arch as do the hoops on the staves of a barrel, all possibilities for self-correction are forever gone.

The lower jaw develops forward, outward and upward; with the wedging force of the teeth destroyed by loss of the normal contact points, one of the most important forces of occlusion is lost; which in turn acts as a force of malocclusion. Not only may we expect a condition of this kind in the lower to become worse, but it in turn reacts upon the upper, and as the teeth of that jaw erupt, though perhaps perfectly normal in the beginning, they will gradually be forced to conform to the lower at the expense of the normal occlusion of the upper teeth. Thus, instead of having a slight abnormality in one jaw we have more or less of a pronounced one in both.

The upper lip, when normal, covers the upper three-fourths of the incisors of the maxilli, and when the teeth are in occlusion and jaws are closed the lower lip covers the incisal fourth of these teeth, hence exerting a force upon their tips, causing the teeth of each jaw, if normal, to retain this position. Or, on the other hand, forcing the uppers into malocclusion by their conformation to bunched lower incisors.

Let us forever, then, throw overboard the idea which should have been buried long, long ago, that the child and his jaws will continue to grow until the teeth finally have room to take their normal position in the arch. The absurdity of this is very evident when we know that the normal development of the jaws depend upon the teeth themselves along with the forces of occlusion.

Thus we see, that in order to have perfect harmony and balance to the face we must have a full complement of teeth and have every tooth in its normal position in the arch. I will say, then, if we have a pro or sub relation of either jaw, that the only way to restore harmony and balance to the face is to place the teeth in normal occlusion, but by all means not to resort to the ridiculous practice of the past of sacrificing a tooth or teeth from one jaw or the other, as the case may be. Of course, the younger the patient the less abnormal the development and the more ideal the possible results.

Let us consider some of the causes of malocclusion which are so prevalent today. It is needless at this time, I believe, to speak of the results

of the premature loss of the deciduous teeth, for we certainly all realize its effects. The wedging force of the teeth is destroyed, hence the development of the jaws retarded, which plays havoc with the space the permanent teeth are to occupy. Prolonged retention of the temporary teeth I have spoken of before; we sometimes have a buckling of teeth in one arch to conform to lack of development in the other, caused by the prolonged retention of one of the temporary incisors or cuspids.

If a permanent tooth is lost, anterior to the erupting molars, the force that develops the jaws is destroyed and the process ceases to be carried forward until this space is closed from behind, thus marring the facial outlines. As the wedging force of the deciduous teeth cause the normal development of the child's face, so the same rule applies to the permanent teeth until all are in their normal position.

We should also bear in mind that the interdependence of the two jaws is so great that extraction, at any time, will greatly influence the position of all other teeth. In losing the lower first permanent molar, we have a tipping forward of the second; from lip pressure all the teeth anterior to the space are prone to move distally; in the force of mastication the tendency is to prevent development of that entire side of the mandible by constant backward pressure on the mesially inclined molar. We have lost the support of the jaws, hence we have a shortened bite, thus creating a small space labio lingually between the upper and lower incisors, permitting the lips to catch under their incisal edges and gradually force the upper teeth forward until we have a protrusion and a lip habit formed to hasten it from bad to worse, all from the extraction of the lower first molar.

In consideration of these facts, which are facts, let us in every case where, if for any cause, a permanent tooth must be sacrificed, immediately, if possible, restore such space with artificial means.

Disuse is another very prevalent cause of malocclusion: this favors a carious condition and increases the impossibilities of use, hence disuse, which in turn (as with any other organ from lack of use) retards the development of the jaws.

Further, we have tardy eruption of the permanent teeth, abnormal frenum, lip and tongue habits, abnormal muscular pressure, obstruction of the nasal passages, which is most powerful in its effect, enlarged or swollen tonsils, causing a mesial locking of lower molars and over-development of the mandible; last, but by no means least, bad dentistry.

The writer has already stated that teeth are held in position by their incline planes, hence a filling that is placed in a tooth without consideration of these facts, and without restoration of occlusion, is worse than a failure. A poor filling put in as an incline plane, in a molar of a developing child, may cause all of the teeth of that side to occupy a position mesial or distal to normal, affect the development of the jaw, and hence the facial lines in proportion.

To correct an irregularity in the anterior part of the mouth, without considering the relation of the incline planes of the posterior teeth, is only to heap failure and disgrace upon our heads, lessen the confidence of our clientele in our ability and deal the science of Orthodontia a deadly blow. If we restore lost tooth structure by artificial means, with no idea of the shape of the normal, if in a molar, we reproduce no buccal groove, no central fossa, no incline planes or cusps; and, I am sorry to say, many times no normal contact, to preserve the space, we are again humiliated with something worse than failure.

In the first place we had only a cavity, with perhaps slight loss of space from destroyed contact; in the end we have not only an unartistic piece of work to look upon, but have many times started a malocclusion, and perhaps a deformity, that will, unless corrected, last as long as life itself.

Thus we see, that whether we correct an irregularity, reproduce tooth structure by a filling, inlay or crown, or even construct a full artificial denture, the zenith of our ambition and the goal toward which we aim should be that of occlusion. It affects our speech, our breathing, the mastication of our food, our hearing, the development of our faces and the condition of our systems in general.

It is not only the basis and foundation of the science of Orthodontia, but the cornerstone and support of modern scientific dentistry.

#### DISCUSSION

R. R. GILLIS: In selecting this subject and essayist, our program committee is to be congratulated. They have provided us something that should furnish us food for earnest thought. Our profession is just waking up to the important and unique position which it has attained during the past years, and the public is just beginning to wake up to the absolute necessity of paying more strict attention to its dental welfare, because dental welfare is absolutely the prime stage from which the public, through each individual member thereof, progresses or reverses to physical weal or woe.

Our Oral Hygiene movement is the "Big Ben" that is waking the people.

And now comes Dr. Mitchell, with this paper on "Occlusion and Its Forces," a subject which if thoroughly understood will be found to be the keystone in the arch which leads to oral hygiene.

Dr. Mitchell is to be congratulated for his excellent essay. I hope he has opened our eyes to a few facts to which we have heretofore been partially blind.

Now, there is one other side from which we ought to view the subject, and this must necessarily be the viewpoint of most of us, namely, that of the general practitioner. Most of us do not engage at all in the practice of orthodontia, but this paper is of just as vital importance to us as though we did.

To Dr. White of Detroit we credit this maxim: "Perfect occlusion is the crowning success of the orthodontist, but it is the life-work of the dentist."

While Dr. Orthodontist comes into contact with irregular teeth and jaws daily and in a few months or years makes them more regular and causes them to nearly approach the ideal positions and form, yet we in the role of General Practitioner must command an army about us that is developing daily toward the normal or toward the abnormal, and if we are good generals we will do our utmost to detect and correct all the misguided forces which mar occlusion.



We must be ever on the alert, watching especially the mouths of our little patients, guarding them and warning them and their parents lest indiscretion and inattention play havoc with the growing mouths and jaws of early childhood.

The forces of occlusion I need only to rename, tongue pressure from within and lip and cheek pressure from without, pressure or obstruction of nasal passages, which is followed by a whole train of undesirable and unfavorable results, finger sucking, tongue sucking, lip biting, improper food and improper feeding; malnutrition, causing arrested development; too early and likewise too late extraction of deciduous teeth, all of which evil effects are more or less interdependent.

Dr. Noyes says, "The adult maxillary bones, which are such important factors in the beauty and harmony of the face, are the result of the sum total of all the forces acting upon them. Normal occlusion is the agency by which these forces are distributed and preserved in balance."

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(Through the courtesy of Dr. Lyman L. Zarbaugh, originator of the moving picture idea as applied to the education of the public along dental lines, we are able to lay before our readers the scenario of a film just completed by the Motionscope Company, Indianapolis, Ind., together with a few sample illustrations, which will give a very good idea of the scope and effectiveness of the entire plan. This film was shown before the convention of the National Dental Association at Washington last month).

## A TOOTHACHE.

**An Educational Offering, Full of Human Interest, for the Benefit of Humanity.**

*Produced Under the Direction of the National Mouth Hygiene Association  
by Motionscope Company, Indianapolis. Copyright, 1912.*

### SYNOPSIS

Jones, at the breakfast table, gets the toothache. The peace and happiness of his little family immediately is destroyed. His daughter, Mary, goes to school, and there, for the first time, comes in contact with the importance of Mouth Hygiene. Brush Drill, Mastication, etc., exercises and the inspection of children's teeth are shown. Mary's thoughts revert to her suffering father at home and, by the aid of her dental literature and tooth brush, persuades her father to call on a dentist. Like his daughter Mary, Jones learns that proper care of the teeth prevents aches and pains and that the suffering incidental to visiting a dentist exists only in the imagination of the ignorant. The dentist makes microscopic examinations, showing germ life in uncared-for mouth, and points out many things of importance in Mouth Hygiene. Jones decides to follow his daughter's example as to use of tooth brush and has dentist to prescribe suitable brushes for each of the entire family, which he buys vowing that hereafter the family shall take proper care of their teeth.

CAST: John Henry Jones; Mrs. Jones, his wife; Mary Jones, their daughter; Master Jones, a toddler; Arthur Moore, a dental inspector; William Brooks, an office dentist; Robert Jarvis, a physician; school teacher, principal and class.

SCENES: Dining Room; School Room; Living Room; Exterior Dental Office, with door; Interior Dental Office (fine modern equipment); seven interior and one exterior scenes.

Title—*HOW IT BEGAN*

*Scene 1:* Dining Room Jones Home. Jones, wife, two children breakfasting. All happy. Jones dips in morning paper—glances up occasionally, smiles at wife and children. Looks at watch—must get to business. Places food in mouth—bites down hard—paper drops—others surprised. Jones half rises, sinks again into chair. Jones grabs jaw—tooth and Jones jump—frightened family arises. Jones arises, bending in pain—shoves Master Jones aside—child cries. Mrs. Jones looks for home remedies. Brings them in. Jones applies—burns mouth. Jones in greater pain. Mrs. Jones hurries cloth and hot-water bottle. Daughter looks at wall clock, puts on hat, takes school books tied with strap from chair—turns in doorway, views mother trying to quiet raging father. Little brother cowers in corner. Daughter scared, hurriedly exits.

Title—*SCHOOL DENTIST ARRIVES*

*Scene 2:* Interior school room. Teacher engaged. Early pupils arrive. Enter Principal, Dentist Moore and Dental Nurse. Principal introduces Moore and Dental Nurse. Dentist Moore hands teacher lesson to put on blackboard. Teacher starts writing.

*Break Scene:* Children continue to arrive and show interest in dentist and nurse.

*Break Scene:* Teacher finishes writing on board.

*Back to Scene:* Mary Jones, with several other children, arrive. All children curious about new lesson on board and presence of dentist and dental nurse.



*Break Scene:* Close-up view of Mary lingering and slowly taking her seat and reading the lesson on board.

*Panorama—Blackboard:* With Mary reading it as she lingers.

*Script on Blackboard:—*

“A clean mouth prevents pain and illness”

“Food left between teeth causes decay”

“Dirty mouths breed disease germs”

“Neglected mouths cause bad breath, bleeding gums and decayed teeth”

“A clean tooth never decays”

“Clean your teeth after eating”

“Coarse food, well chewed, saves teeth, promotes health”

Mary Jones deeply impressed.

General view of school room. Children all seated. Teacher brings class and dentist tells children about the teeth, progress of decay, etc., and will examine their teeth, commencing with the children in the first five seats.

*Sub-Title—Dental Inspection.*

*Scene 3:* Ante-room, the principal's office, with a view of the principal busy at her desk. Dentist sitting in chair with back to window at table examining child, and nurse assisting. Four other children waiting.

Near view of the dentist examining.

*Break Scene:* Title—*Dentist Hands Never Touch Child in Examination.*

*Back to Scene:* Child A. Dentist points to decayed and dirty teeth and makes diagram.

*Break Scene:* Title—*The Result of Neglect.*

*Back to Scene:* Child A examination finished—dentist hands child one diagram, keeps one, and hands one to principal—with Oral Hygiene literature.

*Break Scene:* (Accompanied with marked up reproduction of a diagram.)

*Back to Scene:* Continuing examination. Dental nurse busy sterilizing instruments.

Child B. Dentist shakes head gloomily and with disappointed expression calls principal.

*Break Scene:* Title—*Diseased Gums, Dirty and Decayed Teeth.*

Near view of child's mouth as dentist points out parts, and the principal shakes head gloomily and hands Free Clinic card.



*Break Scene:* Showing large clinic card.

Continues examination.

The dental nurse busy sterilizing instruments.

*Break Scene:* Title—*Protecting Children by Sterilizing Instruments.*

*Break Scene:* Close-up view of sterilizing instruments.

*Back to Scene:* Continues examination.

Child C. Case of adenoids.

Near view of face of this child, pointing out features, narrow arch.

*Back to Scene:* Continued examination. Child D. Healthy mouth. Child smiles and makes gestures indicating she uses tooth brush. Examines mouth—dentist smiles, much pleased.



*Break Scene:* Title—*A Healthy Mouth.*

Parents of this child believe in Mouth Hygiene. (Accompanied with a diagram marked good.)

Near view of this child's mouth, pointing to perfect teeth and gums, showing dentist pleased—showing models of mouth.

*Back to Scene:* Continues examination. Child *E.* Irregular teeth, bad mastication.

*Break Scene:* Title—*Indigestion, Cannot Chew Food Properly.*

Near view of mouth of this child, pointing to irregular teeth and features.

*Break Scene:* Title—*Teaching Children to Chew Food Properly.*

(Same as Scene 2.)

*Back to Scene:* Two brief exercises in chewing. (Same as Scene 2.)

Sub-Title—*How to Use Dental Floss.*

*Back to General Scene:* Dentist takes up dental floss, makes some remarks and gives it to each child. Dentist and nurse guide them in the use of it.

*Break Scene:* Title—*Brush Drill.*

*Back to Scene:* Brush drill. Children come forward, in order, to sink and wash mouths.

*Break Scene:* Near view of bust of one child correctly brushing teeth and washing mouth.

*Scene 5:* Living Room Jones Home. Jones in blankets and big chair. Face wrapped in cloth, burned and swollen. Wife tries to soothe him. Master Jones enters room beating toy drum. Jones starts up impatient in pain. Child, afraid of father, runs from room. Enter family physician. As the doctor looks over Jones, enters Mary Jones, throws hat and school books on chair and runs to father's side. Shows him tooth brush and Oral Hygiene literature she received at school. Father waves it aside as the physician tells Mr. and Mrs. Jones this is not a case for him but a case for the dentist. Mr. Jones demurs and does not want to go to a dentist. It attracts the attention of the father, mother and the physician. They all come forward much interested. Physician looks over the literature and gestures commendingly. Mary shows the physician her tooth brush and tells the physician she is learning to care for her teeth. The physician smiles approvingly. Father Jones finally assents that he will go to dentist and looks questioningly at the physician as to where to go. The physician writes name and address of a dentist and directs him. Mary indicates that she will go with her papa. Father Jones seen putting on hat brought by his daughter. About to exit. Mrs. Jones sinks into chair with an air of relief and smooths head of frightened son.

*Scene 6:* Threshold Dentist Office. "Dentist" lettered on glass door. Jones lingers—frightened—head swathed in flannel his courage fails. About to retreat. Daughter pulls him back by coat-tail. He peers through keyhole. Daughter opens door and shoves parent within.

*Scene 7:* Interior Dental Office. Nervous Jones and daughter met by smiling dentist in white. Dental chair adjacent. Jones eyes chair and instruments in horror. Makes for door, but is intercepted by daughter. Jones finally induced to unwrap face and slowly climbs into chair with every appearance of fear. Dentist examines Jones' teeth—Jones becomes comfortable and loses fear as dentist works. Mary stands adjacent. Dentist frowns as he gets close to teeth.

*Back to Scene:* Dentist completing work. Jones very comfortable. Dentist smiles at Mary and she smiles back, dentist pauses a moment and Jones half rises in chair and grins at Mary. Dentist finished. Jones arises from chair, grins, slaps dentist on back, attempts to tie up head again. He sees. Jones delighted, produces pocketbook, takes out roll of bills, hands three to dentist. Dentist hands two of them back and change. Jones insists that he take more and dentist smilingly refuses. Jones and dentist very



friendly. Dentist interested in Mary and makes reference to her teeth. Mary shows pamphlet she received from school. Dentist smiles approvingly. Dentist commends this work to Jones and points out to him a picture on the wall showing Oral Hygiene exercises in school, shows Jones and Mary educational case containing specimens and other things of interest in this work. Dentist takes case of teeth and shows it.

*Break Scene:* Title—*Ruined by Neglect, Barren of Teeth.*

Near view of above tooth with deposits.

*Back to Scene:* Dentist shows Jones a document, "Report of Cleveland Public School Experiments."

*Back to Scene:* Dentist looks among other papers, shows Jones a letter.

## BOARD OF EDUCATION

### CLEVELAND

Number of pupils receiving dental inspection.....20,890

Number of pupils found to have faulty or diseased mouths.. 97%

Reliably conducted psychological and tests in a class of twenty-seven children, selected as having the greatest oral defects in a school of 846

pupils, gave an average increase in their efficiency for school work of 99.8 per cent. This was apparently wholly due to the correction of their oral conditions and teaching them the proper CARE and USE of their mouths. The improvement in their physical and moral status was quite as marked as that in their activity.

G. C. ASHMUN, M. D.,  
President Board of Education.  
SARAH E. HYRE,  
Clerk, Board of Education.

*Break Scene:* Bust view of Jones reading, deeply impressed.

*Back to Scene:* Dentist shows Jones tooth brush specimen set and explains that every mouth must have a brush that is particularly adapted to it. Dentist points out the several styles and the hardness of bristles, and their use. Jones indicates eagerly he must have brushes for every one of the family. Dentist writes prescription for a brush for each of the family, specifying style and kind of brush for each.

*Break Scene: Reproduction Prescription.*

*Back to Scene:* Jones and Mary bid dentist good-bye and exit.

*Scene 8:* Same as Scene 4. As Jones and Mary enter room Jones produces tooth brushes just purchased, holds them up in clenched hands, looking at Mary, vowing they shall be used. Mother Jones, with the baby, comes forward looking anxiously. Father kisses mother, grabs Master Jones and tosses him. All happy. Jones reproduces tooth brushes and again vows they shall be used. Entire family brushing teeth. Baby Jones in center.

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## A FUNNY FACER.\*

By Dr. Warren M. Clawson, Cincinnati, Ohio.

In facing roots I do not use the root facer having a point which projects into the canal. I use stones of different sizes to enable me to reach each and all parts of the face of the root without impinging upon adjacent tissues, having the end of the stone flat and at right angles with the side of the stone, then using the end and corner of the stone on the side of the stone which is towards the gum tissue and advancing in that direction. In this manner you will be able to reach any and all points of the face of the root without impinging upon the gum tissue. Do not attempt to use the entire face of the stone in grinding, lest it have an inclination to run all around the neighborhood and get drunk before it gets back. Where you wish to reach deep under the gum tissue to get sufficient slant at the labial, an inverted cone-shaped stone answers the purpose admirably.

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\*Clinic Ohio State Dental Society.



## CASES FROM PRACTICE.\*

By Dr. M. M. House, Indianapolis, Ind.

This clinic was one of practical cases of three years' service.

No. 1 was a case of an upper central incisor that had been pyorrhætic for seven years previous to the time it came under my care. It had extended about  $\frac{3}{32}$  of an inch, causing a protrusion one-half the thickness of the tooth, which made it very unsightly in appearance. I removed the nerve and after a treatment of two weeks succeeded in tightening the root. Then, being unable to find a crown or facing that would match the shade of the teeth, I cut the tooth off close to the gum-margin and fitted a post and band on the root. I then reamed out the pulp chamber in crown and shortened same to make normal alignment with the other teeth, and beveled the cervical margin of the crown to fit in lower edge of band the same as for a banded Logan. I then placed inlay wax around post inside of band (which was in position on the root) and pressed crown into same, allowing post to extend into the pulp chamber in crown. I then removed the band, post and wax, after chilling same with ice water, and invested and cast the floor and part reproduced by wax. After polishing, the parts were all cemented in place and made a very natural appearing and seemingly very permanent piece of work.

Case No. 2. Hand-carved and cast crown and bridgework, showing the advantages in hygiene occlusion and art in reproduction of form. As a clinic it may have been of benefit to some who saw it, but for publication I wouldn't consider it as very much.

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\*Given as a Clinic at Indiana State Dental Society.

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## ALVEOLITIS—ITS SURGICAL AND "PROPHYLACTIC TREATMENT"

By M. H. Fletcher, D. D. S., M. D., M. S., Cincinnati, O.

*(Continued from page 682, September Summary)*

## DISCUSSION

Dr. Fletcher's reply to the discussions of Drs. Fickes, Crawford and McCullough: In the absence of a stenographer's report, I will answer written discussions by their subsequent consideration.

Dr. W. L. Fickes, Pittsburgh:

Dr. Fickes refers to the use of the term Alveolitis as "Misleading as to the pathological conditions usually present." Let him substitute Riggs Disease and reread the paper. Or, will he suggest some other name less misleading and paradoxical than Pyorrhea Alveolaris is, when attempts are made to use it to describe the different phases of the disease?

It certainly is no credit to the dental profession (which boldly boasts of its great achievements and advancements) to adhere, as it does, to the name Pyorrhea Alveolaris. Every pathologist knows this name simply describes one symptom of the disease. To say Pyæmic Pyorrhea Alveolaris is to say, a pus-like flow of pus from the alveolus, and so on down the line, in using this name descriptively.

The doctor further says, "Pus flows from the alveoli or tooth sockets during most of the progress of the disease, even though it be not visible to the casual observer;

whereas inflammation of the bone may or may not be present." This statement seems paradoxical, for I do not quite see how we could have a flow of pus (the presence of pus means infection) from the "tooth sockets" without inflammation involving both periodontal membrane and bone.

The essayist, he says, speaks of the "Loss of teeth by destruction of the bone." Dr. Fickes then says, "This is true, but not usually because of infected bone, as the writer would lead us to think, but from absorption of the alveolar process."

Leukocytic action, accompanied by inflammation, is the only process I know of which will cause the alveolar bone to disappear "from absorption." This inflammation must be induced by something. Local irritants and bacteria, either one or both, are present and would most likely be the cause.

Dr. Fickes quotes from the essay as follows: "It takes the cementum longer than bone to repair, and it is the cementum upon which repair is most dependent."

Then he says: "An understanding of the histology of the parts and physiological functions of the various tissues involved is fundamental to a correct conception of the pathology of this disease."

This is especially true in the present instance, and in order that the doctor may go more deeply into the subject I would cite him to such works on Pathology as Delafied and Pruden and George Adami.

The former on "Osteitis," "Infection in Disease," "Suppuration and Inflammation." The latter on the explanation of the "Phenomena of some Phases of Pathology," also on "Cell Activity." The histology and regeneration of the tissues he is supposed to know. Dr. Richard Ownes' "Odontography" is the finest display of the histology of tooth structure I know of, to which I cite him.

I will send the doctor a copy of some recent notes on the Repair of Pericementum and Cementum, which is supported by evidence from Dr. Black's work. I would also ask him to recall some of the radiographs shown of cases where the bone in the sockets had become sound and dense after the approved treatment of bone disease had been given them, also please recall Dr. Black's slide of "Repair of Cementum."

Dr. J. H. Crawford, Pittsburgh:

Dr. Crawford's suggestion as to the nomenclature is good. I have considered the use of Gingivitis, as he suggests, but adopted the plan I did in order to simplify the classification, since gingivitis is always present in every stage. Syphilitic should be used as it is in Conjunctivitis, Tonsillitis, etc. Caries of bone, in my mind, is associated with tuberculous infection and should be used when such conditions seem present. Whereas, any non-living tissue is classed as Necrotic. Carious bone is always necrotic.

When the disease under discussion is thought about and talked of as a bone disease, which I surely think it is, the nomenclature will find its natural and proper expressions.

Dr. A. W. McCullough, Pittsburgh:

Dr. McCullough's expressions are in entire accord with the ideas in the paper, which, of course, is gratifying to an essayist.

I wish to thank the gentlemen who have spoken, not only for their expressions of approval, but also for their keen and intelligent criticism, for by such discussions we arrive at the truth.

## WRONG CREDIT GIVEN

The leading article in September number of THE SUMMARY was written specially for this journal by Dr. L. E. Custer and was not given as a clinic at the Ohio State Dental Society, as a misplaced footnote would indicate.

# SOCIETY ANNOUNCEMENTS

## OHIO STATE DENTAL SOCIETY

Cincinnati, Ohio, December 3, 4, 5, 1912

THE FORTY-SEVENTH ANNUAL MEETING of the Ohio State Dental Society will be held in Cincinnati, December 3, 4, 5. Hotel Sinton will be headquarters. The Meeting Hall of ample size, Halls for Exhibits and Clinics, in fact, the entire ninth floor which was built for such purposes, has been engaged for this meeting.

Your committee has been fortunate in securing some of the foremost men in the profession as essayists; this part of the program is now complete. The list of clinicians is also almost full. The thousand and one business details are all in good shape; in short, the feast is prepared and ready. Get your business affairs in shape to attend what we believe will be one of the best dental meetings held this year.

There are ten hotels within three squares of the meeting place; we will send you rates later. Within this same territory are restaurants too numerous to mention, large and small.

Theatres, about a dozen; speak any language that you wish, they will take your money just the same. The lights will be burning as brightly as of yore and music with its attendant charms will welcome you. A special committee will be appointed to see that none go astray. This meeting will afford an excellent opportunity for class reunions. Do not fail to attend as the Cincinnati dentists will welcome you and endeavor to make your stay as pleasant as possible.

COMMITTEE OF ARRANGEMENTS.

Cincinnati, Ohio,  
September 23, 1912.



**INSTITUTE OF DENTAL PEDAGOGICS.**

The next annual meeting of the Institute of Dental Pedagogics will be held in Piitsburg, Pa., January 28, 29, 30, 1913. An unusually interesting program has been arranged, and no progressive dental teacher can afford to miss this meeting.

FRED W. GETHRO, *Secretary.*

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**ILLINOIS STATE BOARD OF DENTAL EXAMINERS.**

The semi-annual meeting of the Illinois State Board of Dental Examiners, for the examination of applicants for a license to practice dentistry in the State of Illinois, will be held at the Northwestern University Dental School, corner Lake and Dearborn streets, Chicago, beginning Monday, November 11, 1912, at 9 A. M.

All applications, together with the fees, twenty-six dollars (\$26.00), must be filed with the secretary at least five (5) days prior to date of examination. Address all communications to

T. A. BROADBENT, *Secretary.*

705 Venetian Bldg., Chicago, Ill.

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**MONTANA STATE BOARD OF DENTAL EXAMINERS.**

The Montana State Board of Dental Examiners, at its annual July meeting, canceled all its reciprocity contracts with all the states with which Montana had exchange, it being the unanimous opinion of the Board that such an exchange was not of any benefit to Montana or the states concerned.

DR. R. R. RATHBONE,

Judiciary Com., Dillon, Mont.

Dillon, Mont., July 25, 1912.

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**UNION MEETING—7th AND 8th DISTRICTS OF NEW YORK.**

On November 14th, 15th and 16th, 1912, there will be held what is confidently expected will be the largest meeting of the dentists of eastern, central and western New York, as well as a number from western Pennsylvania and adjacent points in Canada. As it is two years since the Seventh and Eighth District Dental Societies have held a union meeting, every member of these two societies and a great number from the Fifth District Dental Society of the same state are expected to attend and help promote the interests of this meeting.

Prominent essayists and able clinicians have been secured to provide those who attend with plenty to think about on very interesting subjects and helpful assistance they can use in their everyday practice.

There will also be an extraordinary large exhibit of the different manufacturers from all over the country, who will bring the latest scientific

methods and appliances for demonstration by men who are thoroughly conversant with the needs and requirements of dentists, and every dentist within convenient distance should make it a point to be at this important meeting, where there will be so much to learn and see which will be useful in helping him to become a better practitioner.

Business Committee:

E. G. LINK (Chairman),  
E. L. SCHLOTTMAN,  
G. C. LOWE.  
M. B. ESCHELMAN.  
G. M. HUGHEY.  
G. M. FIERRO.

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### THE NORTHERN INDIANA.

The Northern Indiana Dental Society held its twenty-fourth annual meeting at Rome City, September 3 and 4, 1912.

The location is a summer resort on Sylvan Lake, and many of the members took advantage of the opportunity to spend the time, and several days preceding, at this popular summer resort.

At the business session Gary, Ind., was selected for the 1913 meeting, and as this will be the twenty-fifth anniversary meeting, plans are already being laid to make the next meeting the big dental event in Indiana for next year.

The following officers were elected: M. E. Le Galley, Lafayette, president; Robert Gillis, Hammond, vice president; W. L. Myer, Rensselaer, secretary; O. A. Van Kirk, Kendalville, treasurer; E. P. Kelley, Gary, superintendent of clinic.

On Tuesday, the afternoon was devoted to a launch party for all the ladies in attendance, and following adjournment Wednesday the entire assembly was taken on a launch trip around the lake by the dentists of Kendalville.

ROBT. GILLIS, *Secretary*.

Pluck wins! It always wins! Though days be slow,  
And nights be dark 'twixt days that come and go,  
Still pluck will win; its average is sure—  
He gains the prize who will the most endure;  
Who faces issues; he who never shirks;  
Who waits and watches, and who always works.

—J. B. Goode.

# OBITUARY

## DR. W. N. MERRITT

As briefly announced in our September number, the death of Dr. W. N. Merritt, a leading dentist of Norwalk, Ohio, and one of that city's most prominent, honored and respected citizens, occurred on August 6.

At the time of his death the doctor was thought to be rapidly recovering from an attack of angina pectoris, with which he was afflicted and which at one time was considered most serious.

On the day of his death his condition was much improved and he sat up nearly all day in an easy chair, and was sitting in the chair when the death messenger came. During the afternoon he walked out onto the porch on the second story in the rear of the home, where he watched his children and a number of others play tennis.

Between 7:30 and 8 o'clock, while Dr. Merritt was sitting in his bedroom conversing with his two children and a trained nurse who has been in attendance from the beginning of his illness, he suggested that they have some music and asked why they did not start the Victrola, which was on the lower floor. The suggestion was quickly acted upon and the two children, accompanied by the nurse, went down stairs. The nurse was the first to return, having been out of the room only a few moments. When she entered the room she found the doctor with his face resting on his hands, which were upon his knees. The spark of life had fled.

Dr. Merritt had been an active business man of Norwalk for about twenty years, having begun the practice of his profession of dentistry there when he finished his course at college. He was most successful in his profession, for many years being associated with Dr. McDonald in the Gardiner block, afterward conducting an office independently in the former office of Drs. Read & Ford, on Benedict avenue, in which place he was located at the time of his death.

He was prominent in the business affairs of the city and always anxious to advance the best interests of Norwalk. He was a director of the Citizens' Banking Company from the opening of that institution. He erected the two-story brick block in the rear of the Glass block, that bears his name, a few years ago, and expected, in the near future, to erect another handsome block.



Dr. Merritt was a member of the city board of education previous to the present one and was instrumental in introducing into the public schools manual training and domestic art. Having accomplished this, he declined a nomination for another term.

Dr. Merritt was a trustee of the Presbyterian Church. He was a member of the building committee that had charge of the recent remodeling of the church structure.

The only secret organization to which the deceased belonged was the Masonic body, having attained the degree of Knight Templar.

Dr. Merritt was born on a farm in North Fairfield township, April 27, 1864, the son of Mr. and Mrs. Samuel Merritt. He was reared in North Fairfield and received his early education there. He studied dentistry in Columbia College, New York City. He has been a resident of this city since 1893.

In June, 1896, he was united in marriage to Miss Mary Ford, daughter of the late Doctor and Mrs. J. B. Ford, who, with two children, Ford, aged 15, and Cornelia, aged 12, survive. Dr. Merritt is also survived by his mother, who lives in Coldwater, Mich., and one brother, James Merritt, of the same place.

Dr. Merritt was a man and a gentleman in every sense of the word; a leader in his profession and community; a staunch and loyal friend, one whom it was an honor as well as a pleasure to know. He will be missed, professionally and socially, and the place he filled in the hearts of those who knew him never can be filled.

### IN MEMORIAM

WHEREAS, It has pleased Almighty God in His Providence, to remove from our midst our esteemed fellow-townsmen and brother dentist, Dr. W. H. Merritt, who departed this life August 27th, 1912; and

WHEREAS, By his death our community has lost a citizen who was highly esteemed, and the profession a highly respected member who, throughout his career, was alive to the best interests of his patients as well as the general good of the profession and the community in which he lived; and

WHEREAS, By his death the profession and community have sustained a great loss; therefore

*Resolved*, That we, the dentists of Norwalk, Ohio, as well as the dental associations of which he was a member, feeling his loss keenly, hereby express our sorrow over his early death and extend to his family and friends our abiding sympathy; and be it further

*Resolved*, That a copy of these resolutions be sent to the bereaved family and to THE DENTAL SUMMARY for publication is the wish of the dentists of Norwalk.

J. H. BILLMEYER,

T. S. SEELEY,

*Committee.*

**DR. JOSEPH P. ROOT**

Kansas City, Mo., Sept. 4.—Injuries resulting from swinging at a golf ball on the Evanston links last Saturday afternoon caused the death this morning, at the German Hospital, of Dr. Joseph P. Root, 3512 Wyandotte street.

Doctor Root was the editor of the *Western Dental Journal* and was ranked with the ten best dentists in this country. His death followed a second operation in a last effort to save his life.

Dr. Root was playing at the Evanston Club, of which he is a director, last Saturday afternoon. In swinging at a ball he tore the tissues of his groin. He was rushed to the German Hospital and operated on immediately. Gangrene set in, however, in about three hours after the injury, and another operation was performed this morning.

The attempt to save his life was in vain and he died at 10 o'clock of strangulated hernia. Physicians say that gangrene setting in so soon after an injury is very rare, and are at a loss to account for its occurrence in this instance.

Dr. Root was 51 years old and the son of Dr. J. P. Root, who was minister to Chile under President Grant and later lieutenant governor of Kansas. He was born in Kansas City, Kan., and has practiced dentistry in this city during the whole of his professional career. He has been connected for some years with the *Western Dental Journal* and is one of the best known men in his profession in the world.

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A young man still in the early 30s, though a power in the business world, got his first position, one of office boy, in the following manner: He entered a business man's office the afternoon of the day he quit school. "I'm in a hurry, if you please," he said to the man, who paid no attention to him, though he had been in the room a minute.

"What do you want?" asked the man deliberately looking up from his paper.

"I want a job as office boy," he answered.

"Well, what are you in such a hurry about?" queried the man, astonished.

"Because I've been out of school two hours now and haven't got a job yet. If you haven't got a job for me, why say so, and I'll move along, as I haven't any time to lose."

"I guess I need one of your kind," said the man. "You can stay."

**It is better to prefer honorable defeat to a mean victory, to lowering the level of our aim that we may more certainly enjoy the complacency of success.**

—John Ruskin.

# NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

## WHAT IS DOING IN THE SOCIETIES

### THE OHIO STATE

The Ohio State Dental Society, which usually meets in Columbus, will hold its next annual meeting at the Hotel Sinton, Cincinnati, Ohio, December 3, 4, and 5, 1912. A big meeting is already assured.

F. R. CHAPMAN, Sec'y.,  
305 Schultz Bldg., Columbus, O.

### THE NATIONAL ASSOCIATION

**Reorganization Effected — Name Not Changed—Officers Elected—Kansas City Next Year—San Francisco 1915.**

Washington, D. C., Sept. 12.—Officers were elected and Kansas City was selected as the meeting place next year at today's session of the National Dental Association at the New Willard.

The officers elected were: Frank O. Hetrick of Ottawa, Kan., president; Thomas Hartzell of Minneapolis, Minn., vice president from the west; V. H. Jackson of New York City, vice president from the east, and John H. London, of this city, vice president from the south; Charles W. Rogers, of Boston, Mass., was re-elected corresponding secretary, and Homer C. Brown of Columbus, Ohio, was re-elected recording secretary.

The executive committee was elected as follows: J. D. Patterson of Kansas City, Mo., chairman; C. M. Works of Ottumwa, Iowa; W. G. Mason of Tampa, Fla.; Victor H. Jackson of New York City; Victor S. Jones of Bethlehem, Pa., and M. F. Finley of this city.

The executive council members elected follow: H. J. Burkhart of Batavia, N. Y.; Charles McManus of Hartford, Conn.; Eugene B. Warner of Denver, Col.; B. Holly Smith of Baltimore, and President Hetrick and Dr. Brown, the recording secretary.

It was decided to hold the convention next year at Kansas City during the week of July 8.

DR. BLACK IS HONORED

Announcement was made by Dr. Florestan Aguilar, court dentist of Spain and

secretary of the International Dental Association, that a gold medal had been conferred upon Dr. G. V. Black of Chicago, Ill., by that body in appreciation of his work in the profession.

The reorganization of the association was effected by the adoption of the constitution as drafted by the reorganization committee. By the provisions of this constitution the name of the organization will remain the National Dental Association, and membership in the organization may be secured by any member of the dental profession in good standing in any state of the Union.

A special meeting of the National Dental Protective Association, which has in charge the defense of the Taggart-Boynton suit, was held at 5 o'clock.

Late yesterday afternoon the Association voted to hold its 1915 meeting in San Francisco, in connection with the Panama Pacific Dental Congress during the exposition in that city.

Dr. Frank L. Platt of San Francisco extended the invitation to the association through a committee of which he is chairman. In connection with his invitation, he said the National Dental Association is invited to become a part of the Panama-Pacific congress commission of 1915. He explained that there are more than 1,200 hotels and apartment houses now in San Francisco and that many more are to be built.

"For the accommodation of the congresses to be held during the exposition a great auditorium is to be constructed in the new civic center of San Francisco, where will be built a new city hall, an opera house, a library and other public buildings, costing in all more than \$8,000,000," he said. "For this auditorium the exposition company has appropriated the sum of \$1,000,000, and here we are assured of ample room for our convention and exhibits."

The session of last night was taken up by addresses of Dr. Harvey W. Wiley, former chief of the bureau of chemistry, and Dr. George E. Hunt, of Indianapolis, on subjects connected with oral hygiene and the care of children's teeth.



# THE DENTAL SUMMARY

The Magazine That Helps

Vol. XXXII

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## SOME NEW AND ORIGINAL DENTAL INSTRUMENTS.

By W. C. Dalbey, A.M., D.D.S., DuQuoin, Ill.

I HAVE in mind two principal objects in presenting this paper to the dental profession.

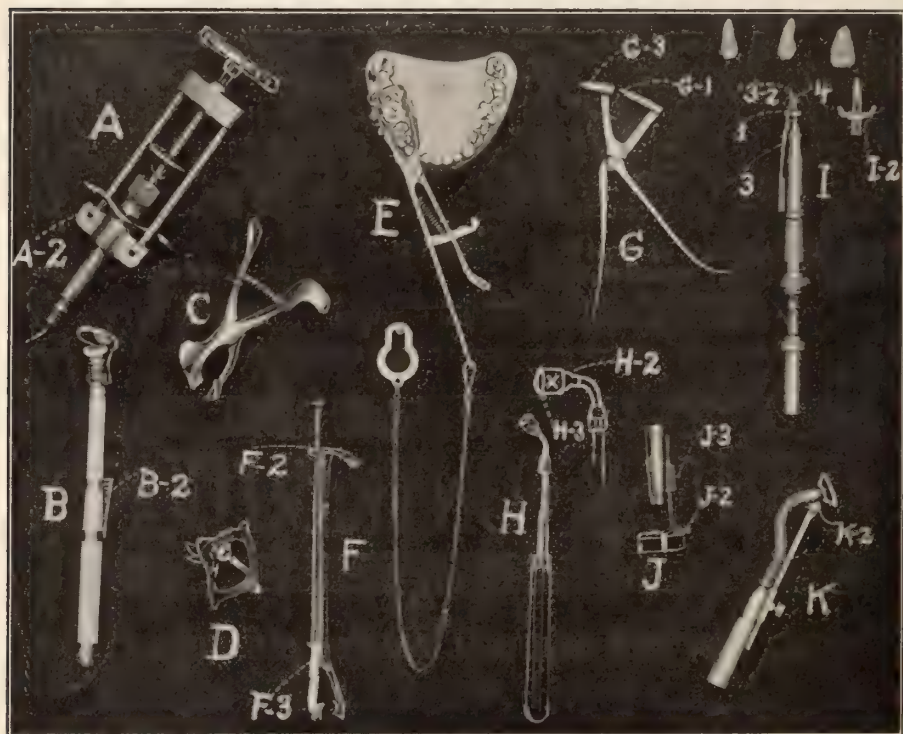
First, to show the true merits of the several new instruments here described. Second, to inspire, if possible, some in the profession to invent new, and improve on their old instruments, if possible. I believe we progress professionally only as fast as our equipment will allow.

Now don't say you can't, or you have no time. I know better. There are many hours when circumstances allow you no patients. Instead of using these precious moments in standing around or reading a novel, smoking and "cussin'" your luck, begin thinking and work your thoughts out at your finger ends. Give us something that will show you are the true genius you try to make your patients think you are. The field is large. There are

few instruments that come to me that I can not see where at least some slight improvement can be made. Some of these I am still working upon.

The manager of one of the largest dental supply manufactories in America recently told me that it was the manufacturer largely who had invented the dental instruments. And it was the manufacturer that had brought dentistry to its present perfection. While I took the remark with a good supply of salt, I had to admit there was some truth in the statement.

Therefore, I trust this paper will be the means of inspiring some of the dentists, rather than the manufacturer, to greater endeavor along the lines of invention, and also cause many to realize they can actually make many



of the instruments necessary to add better equipment to their practice as well as to make crowns and bridges and artificial dentures. And when the instrument comes from your hand it will be far more practical than from some manufacturer who may have had little or no experience along the lines of practical dentistry.

The first instrument in the series is an obtunder "A." The syringe is an ordinary all metal type. The frame for holding the syringe is easily made. The power screw is double-threaded for speed. The screw point inserts into a countersink in center of thumb end of piston. An ordinary obtunding needle is used. The frame is hinged at A-2, to facilitate removal of syringe for other purposes.

This or any other obtunder ought never to be used in my opinion, unless it is desired to remove the pulp.

B is an electric mouth lamp of three and one-half volts. Two ordinary cells of the variety used in automobiles for ignition purposes. Every dentist should have a mouth lamp and the making is so simple that I will not take the space to describe it in detail. At B-2 is a switch for continuous or flash light effect.

C illustrates an invisible premolar forcep. It will, however, extract any deciduous tooth very nicely. This forcep cannot be seen by the child and it appears as though the teeth are being extracted by the fingers only. The thumb and index finger clasp over the jaw end of forcep.

D is an individual tooth dam clamp. Rubber about 1 1/2x2 in. in size is used with the clamp, showing a marked saving in rubber. The rubber is held in place by the four horns seen in illustration. The frame may be removed and of course the clamp can be used for ordinary purposes. The frame is made to adjust itself to different sized clamps of the ordinary Ivory variety with the projecting horns.

To make this device, first make a pattern of thin sheet lead and bend it to fit your clamp, then straighten out on a piece of German silver or platinum sheet and mark and cut out.

E is an instrument for steadying and slightly elevating from the socket an abscessed tooth when opening for treatment. It is made similar to a clamp forcep only instead of opening the clamp it clamps the clamp harder when in use. This instrument can be used with any ordinary clamp and it may be used on any tooth that can be clamped. Small rubber tubes are slipped over the clamping horns to protect the teeth used as fulcrum.

F is an instrument used for the same purpose as the one just described, but it is for molars only. No extra clamp is used and the locking is accomplished by teeth on clamping rod at F-2. At F-3 is shown the incline plane block for closing the jaws. Both of these instruments will keep the pressure off of the tooth and bring comfort to the patient and joy to the operator.

G is an instrument for manipulating the jiffy cement tube without getting the cement all over the fingers and without waste of cement. With this instrument one is also enabled to get to the back of the mouth with ease. The photo shows readily how it is made. The tube is filled in the ordinary way and placed in holder G-3. The cap of a No. 3 capsule is then placed in large end of jiffy tube, closed or rounded end first. The piston being on a pivot, is swung into place and inserted in opened end of capsule by closing on handles of instrument. As the piston goes to place the capsule seals the large end of tubes and there is no back shooting of cement. The peculiar three-cornered point G-1 then punctures the cap and all of the cement is driven out by closing in on instrument handles. The instrument is now laid aside while the crown or bridge is being placed. Afterward the instrument is opened when it will be found the jiffy tube is cemented to the piston. It may readily be peeled off with a pen knife blade.



The next instrument, H, is for anesthetising a tiny area by pressure at the place you desire to insert the needle for local anesthesia. Patients will tell you usually, that the inserting of the needle caused more pain than the extraction of the tooth. This instrument is designed to do away with that pain caused by inserting the needle.

The instrument consists of a small holder or socket filled with unvulcanized rubber. See H-2, enlarged view. The rubber is allowed to project beyond the edge of metal socket somewhat. Over this socket with its rubber (see enlarged view X, cross section H-2) is placed a short piece of rubber tubing to extend an eighth of an inch beyond the metal socket. See H-3. A socket may be made of an old hypo needle screw end, round type. Enlarge place for unvulcanized rubber by drilling out threads. To use, take a tiny pledget of cotton not larger than a pin head, and after dipping it in a solution of phenol and cocaine crystals, place against the red rubber at bottom of the socket. Then press against the gum where desired to afterward insert the hypo needle. The little piece of rubber around the socket prevents the escape of the anesthetic which is pressed into the gum tissue. In a moment a tiny area is anesthetized and needle may be inserted without pain.

I is an instrument for beveling the root for a banded crown and without mutilating the gum. The instrument slips over the hand piece. A rather strong flat spring holds a pivot with collar, Fig. 3, which is adjustable to make the width of bevel by set screw, Fig. 1. A beveling bur, Fig. 4—a cone, if the proximal space will allow, or a small lancelated finishing bur is used for cutting down the margin of the root and giving the desired bevel. To operate, enlarge the canal for collared pivot, Fig. 3-2, start your engine which revolves your beveling bur. Insert your pivot, bringing your bur to margin and revolve your hand piece two or three times around the root and the bur has cut a clean and smooth bevel. Do not allow the hand piece to rest from revolving when your bur is turning. If you should do this the bur would cut a notch in the side of the root. If you desire to cut more at one place than another rotate the hand piece back and forth at the desired place till the amount necessary is removed. It makes no difference as to the general shape of the root; the flat spring will allow the bur to conform to it. The cap is then swaged or cast. The bevel is perfectly smooth and a fit assured. Fig. I-2 shows cross section of cap with pin. The roots in photo are somewhat enlarged.

J shows a wheel guard. This guard is adjustable to sizes from one-quarter to one inch in diameter. The adjustment is made by turning screw J-2, which actuates a beveled block upon two German silver wires that constitute the guard proper. Some times the mandrels are not the same length, calling for an adjustment lengthwise. This is done by screw J-3.

K is a flexible arbor for carborundum stones and such like. It is capable of holding wheel at any angle desired. I find it especially useful for grinding the back molars when a straight mandrel is precluded. After adjustment, set the screw, marked K-2, and the arbor is as rigid as a straight

mandrel. A duplex spring is used inside the coil spring shown in photograph. Of course the spring shown does not move. The duplex is fastened to a short mandrel that holds the grinding wheel. A guard, not shown in photograph, is slipped on back of the wheel for safety. The shell that slips over the hand piece as well as those of the two instruments just described, are made from rifle cartridge shells. With a little patience every one of these instruments may be duplicated by the average dentist, and they will be found to be a valuable asset to the dentist's equipment.

## REMOVABLE BRIDGE WORK.\*

By Dr. John L. Kelley, Chicago, Ill.

IN ALL FORMS of bridge work one of the principal aims is the preservation of the roots, and the removable bridge offers the best means in this direction for three reasons. First, the stress can be better distributed. Second, the roots and bridge can be cleaned. Third, the correct occlusion can be more easily obtained and retained.

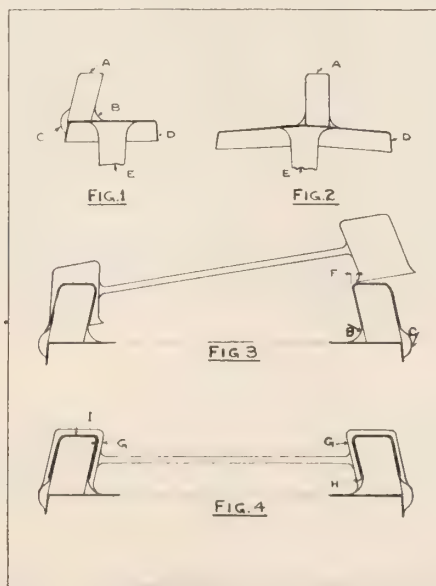


Plate 1

Four different views of the attachments in relation to the copes and in their relation to each other.

Fig. 1. A transverse section of the mesial distal view of attachments. A, holding post; B, C, fillet; D, cope; E, dowel pin.

Fig. 2. A buccal lingual view of the same attachments.

Fig. 3. Bridge tubes connected by a bar in the act of being placed on adjusting tubes (indicated by heaviest lines), which are in position on holding posts at base of which fillets B C are shown.

Fig. 4. Bridge tubes (G) connected by a bar in place on adjusting tubes (H) and holding post. Space between G and H shows amount of play between tubes when in position.

\*Read before the Lake Erie Dental Association, 1912.

I will consider the subject in three parts:

First—Description of attachments and principle of retention.

Second—The construction of a simple case.

Third—Construction of a complex case, followed by illustrations of other cases.

#### ATTACHMENTS.

The attachments consist of three parts: Holding Post, Adjusting Tube and Bridge Tube.

The Holding Post is usually made of round iridio-platinum wire varying in size from 14 to 10 gauge. When it is necessary to use a larger size

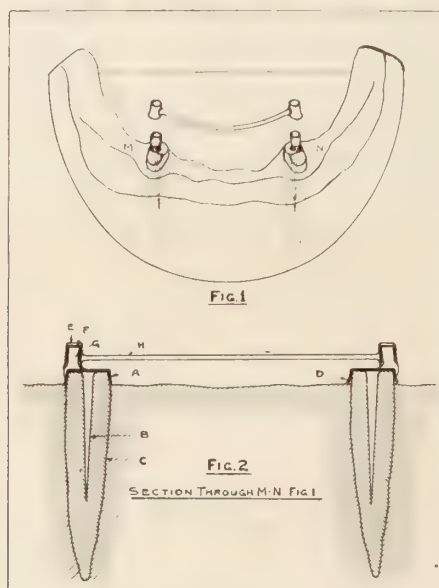


Plate 2

Fig. 1. Model of a lower case where only the cusps remain showing root, pin, cope, holding post (M, N), adjusting tubes and above, bridge tubes connected by bar.

Fig. 2. A transverse section of the same model. A, cope correctly adjusted to root. B, dowel pin in root. C, root. E, bridge tube. F, adjusting tube. G, holding post. H, connecting bar. D shows cope incorrectly adjusted to root, which happens in adjusting cope when root is not properly prepared.

than 10 gauge the holding posts are made hollow, varying in size from 10 gauge to one-half inch in diameter.

The Adjusting Tubes vary in size so as to telescope or fit the holding posts.

The Bridge Tubes also vary in size to fit or telescope the retaining tubes.

#### RETENTION.

The object of the holding post is to give retention by forming an undercut or dovetail. The degree of retention depends on the length of the posts, their number, distance apart and the fit of the tubes. An increase or decrease in any one of these elements will vary retention.



For example, having a one-inch space on a level surface between two holding posts, each post 1-8 inch long and inclined 1-64 inch, the fit of the tubes upon these will admit of some play and it will be found that they can be placed or removed at will. Should the inclination be greater than 1-64 inch, it will be found impossible to place the bridge tubes upon the holding posts without something "giving."

This difficulty may be overcome by shortening the holding posts and the adjusting tubes because holding posts less than 1-8 inch long compensate for extra inclination that has been made.

The different uses of the adjusting tubes are as follows: To center the bridge tubes; to take up an excessive amount of play between the bridge tube and the holding post; to lengthen the holding post when it is too short or its inclination is not great enough and to be a means of adjusting the retention.

The object of the bridge tube is to give retention to the bridge when adjusted correctly to either holding post or holding post and adjusting

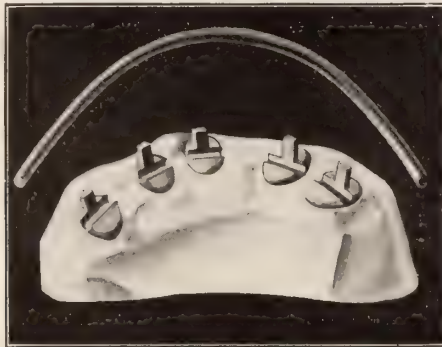


Plate 3

Shows five copes in an upper case invested and prepared for the connecting bar, which is generally made of round iridium platinum not larger than 14-gauge.

tube. Having retaining tubes in position on holding posts, the bridge may be adjusted to position by the shortening of the bridge tubes, since the variation in length of any of the parts of the attachments varies the retention.

Example—When a bridge is made where all adjusting tubes have been cemented on holding posts, it will be found that it is possible to adjust the bridge into position by shortening the bridge tubes, but it is generally better to adjust retention by removing one or more of the tubes rather than shortening holding posts or bridge tubes.

#### REMOVABLE BRIDGE WORK.

A simple case is one wherein all teeth are missing on lower and upper, except lower cuspids. In this case the roots of the cuspids should be used to carry the attachments.

The first step is to cut off the lower cuspids and then fill roots; then make both upper and lower plates. The object for making both upper and lower (which will obtain in many cases where removable bridge work is considered) is to give an opportunity for putting the roots at rest and studying the case.

If the dentures prove satisfactory and the roots are in a healthy condition, the next step is to make the lower bridge, beginning with the preparation of these roots and making of the copes.

#### DESCRIPTION OF DIE PLATE.

After studying the anatomy of teeth I learned that the variation in form at the gum line of the upper and lower bicuspid, cuspids and incisors, was not usually great. In all these teeth there are usually not more than eight different shapes at the neck.

The central in some cases is the shape of the lateral or lower bicuspid, and vice versa. The upper cuspid in a number of cases is the shape of lower

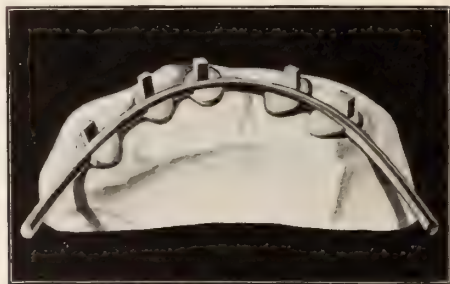


Plate 4

Shows the same case with bar in position for soldering.

cuspid and vice versa. The upper bicuspid generally varies from an ellipse, being concave on one or both sides. The lower incisors are the same shapes as the upper or lower cuspid or upper bicuspid.

To make a cope in the die plate, the measure of the root is taken to give us the form and circumference; then by comparing the wire form with the dies we make our selection. To determine the correct die we cut and straighten out wire, compare it with scale found just below each row of dies. The next step is to place metal for the cope—gold or platinum—over this die and tap it with a soft piece of wood, annealing it from time to time and finally forcing it into place by hammering a piece of pure lead into it. This takes from three to five minutes. The cope is then removed, annealed and trimmed, its edges filed and sharpened and it is ready to be adjusted to the root. Adjusting is done by pressing it on with a soft piece of wood after which a hole is punched in the cope opposite the root canal and a pin adjusted and soldered to place. The cope is now completed and placed on the root. After a wax bite and plaster impression are taken, the copes are lined and the pins are slightly coated with vaseline and the impression is run up. The model is then prepared and mounted on the

articulators. Then set up six anterior teeth to determine where holding posts are to be placed in relation to teeth and tongue. The holding posts are generally placed at the distal of the cuspids or in the interproximal spaces and in such a position that they will incline slightly toward each other; the amount of inclination depending on the distance between the posts and their length; for the greater distance apart and the shorter the post the more inclination there may be, and vice versa.

After determining the position of the holding posts, the teeth may be removed and the holding posts waxed securely to the copes so that they will not be displaced during investing.

I have found, with a certain method of manipulation, that Detroit Investing Compound gives satisfactory results by mixing this material very little—to the consistency of putty or so it can be easily handled with the hands and allowed to dry in the air. By applying heat directly to it

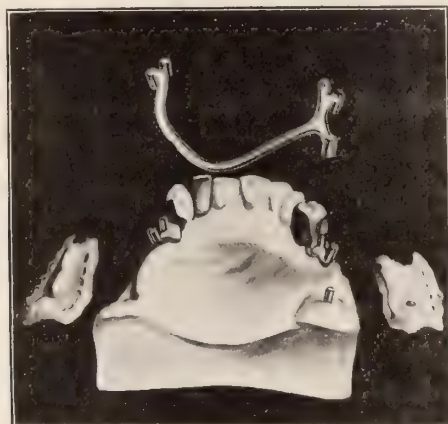


Plate 5

Model of upper, where cuspid and bicuspid on one side and first and second bicuspid and lingual root of second molar on the other side, have been prepared to carry attachments. The copes carrying holding posts and adjusting tubes are in position on the roots. All the attachments incline buccally and converge toward or diverge from each other. Above model is pictured the arch bar carrying bridge tubes. On either side of model the saddles are shown.

with a blow-pipe, it does not crack and so far as I have determined, it does not expand or contract. I would advise its use in this work. To obtain a material which is much harder and will stand more heat and manipulation, a 1-4 quantity of Dr. Spence's plaster should be mixed with it. First stir Spence's plaster for two minutes, having it the consistency of soft putty, then the Detroit Investing Material to the same consistency and mix both together with the hands.

Invest the copes and holding posts attached to them so that the greater part of the copes are exposed, but the greater part of holding posts are covered by the plaster. Apply heat directly to the copes and holding posts



with a blow pipe, until white hot and then place a small quantity of platinum solder at the junction of the posts with the copes and hold heat on until solder melts. Next the complete cope is reinforced with pure gold and then copes and holding posts are removed from the investment, ground and polished until the adjusting tubes will slide with ease over the holding post. (Caution: Where holding post is soldered to cope it is well to allow a greater thickness of solder.) Flare the orifice of the adjusting tube so that it will fit over the enlargement. Always cut the adjusting tube so that the top of the holding post, the height of holding post should not be increased more than the thickness of adjusting tube, or 1-10 M. M. The reverse plan is adopted with the bridge tube.

Next cement the adjusting tubes on the holding posts and polish them so that the bridge tubes will easily slide over them, having the bottoms of the bridge tubes touch the tops of the copes. Place tinfoil on model, set



Plate 6

A lateral view of model in Plate 5. This picture shows more plainly the convergence and divergence of the attachments. The two anterior on left side diverge from each other mesio-distally, the two anterior on the right side also diverge from each other mesio-distally, but the molar attachment inclines mesially toward the distal anterior. This divergence and convergence causes a lock or dovetail and gives retention to the attachments. The saddles are shown in position on the model and above, the arch bar carrying the bridge tubes.

the teeth again in place, extend a bar (the size and material of which depends upon the material used in the bridge) and wax the end of the bar to the bridge tubes.

In order to remove the bar waxed to the bridge tubes without changing its position, mix quick-setting plaster very thick and place it on the bar and attachments. After this plaster has hardened, it is removed, carrying with it the bridge tubes, also the copes carrying the holding posts. Remove the copes, leaving only bridge tubes and bar in the impression.

Plumbago or ordinary pencil lead is now placed in each bridge tube, allowing one-half inch to extend above. Then a line of wax is run from each joint (to more easily locate them) out upon the impression.

Now the investment is mixed. It should cover the pencil lead and fill the entire impression except where the line of wax has been run to locate the joints. After the investment has hardened, the joints are located and soldered. The plaster should next be removed and the inside of tubes cleaned, polished and placed in position on the holding posts.

Next the teeth are set up (removable facings preferred) and the different relations tested: first the relation of the saddle with attachments to the gums, and second the relation of the occlusion together with the saddles and attachments. To test the relation of saddle to the gums, place a finger on bridge above each attachment, holding them firmly to maintain their relation to each other, at the same time pressing the most distal points on either side of the bridge, and if there is no rock this relation is correct. If not satisfactory, adjust the bridge until the correct relation is obtained. To test occlusion, have patient bite firmly and if the relation of the saddle

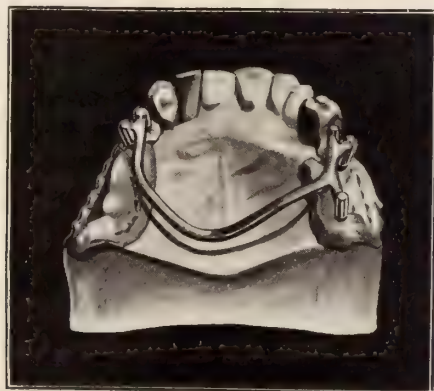


Plate 7

A different view of the same model, showing the arch bar in relation to the saddles and the model.

to the gums has not been disturbed, the occlusion is correct. If not correct, it may be due to one of two things either the model is wrongly placed on the articulator or the correct bite was not obtained. (Caution: Never open or close the bite in the articulator.)

After these tests the case is prepared for casting. Wax case correctly, soap stone the model, remove adjusting tubes from holding posts, place copes in their correct position on the model and then adjust the bridge. Next, two broom straws, previously dipped into melted wax, are now placed across the arch from one second bicuspid to the other and waxed firmly on either side. These act as a brace for the sprue wire and also a conductor for the metal. Four other large straws are extended from different parts of the bridge toward the sprue wire touching the sprue holder and then waxed into position. The case is now covered with investment, leaving only the free ends of the straws and the sprue wires exposed. After the investment has slightly hardened, the bridge is removed from the

model and placed into a flask and both bridge and flask are filled with investment which is allowed to harden over night. Next day place flask in inverted position on a slow fire until wax has been thoroughly burned out. Now the case is ready for casting.

Turn on the blow-pipe and heat the flask and investment for five minutes, then place sufficient aluminum for the making of bridge in the crucible of the flask and again turn on blow-pipe until the aluminum is melted. Now, carefully remove the flask from the fire into casting machine and again apply flame on the aluminum until it is in a molten state. After the air is applied and held on it for five minutes, the bridge is cast. Remove from the machine and allow it to cool slowly for an hour, after which time the bridge may be removed from flask, cleaned and polished, and the copes and holding posts adjusted to it. Now remove copes from bridge; place them on the roots in the mouth, adjust the test bridge in the mouth in the same manner as before casting. If the bridge fits correctly the copes may be cemented to the roots. The bridge is again tested. If correct, there will be no further difficulties experienced.

The adjusting tubes should not be cemented on to holding posts unless the bridge becomes so loose as to be annoying to the patient, and then only one should be cemented on the side that is loose. This seldom or never occurs unless the holding posts have not been placed in correct relation to each other.

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### PRACTICAL FIXED BRIDGEWORK.\*

By A. J. Bush, D.D.S., Columbus, Ohio.

Professor Crown and Bridgework, Metallurgy and Orthodontia, Starling-Ohio Medical College, Columbus, Ohio.

**W**HILE all branches of dental science present innumerable opportunities for exercising skill and judgment of the highest order, yet, to many, bridgework affords a field of endeavor infinitely more absorbing in conception and practical application than is offered by any other phase of dental art.

Indeed, it would seem that no other phase of dental science can ever hope to exceed or begin to offer the great possibilities of achievement that so closely challenge all of man's resources in creative art, inventive genius, scientific attainment and mechanical skill as are demanded in the conservation and reconstruction of partially lost and totally missing organs of mastication.

Modern dental bridgework has received a tremendous impetus in its scientific development and practical application since the advent of the casting method, and the methods of construction, principles of application and the variation of details have accordingly become so complex and confusing that one must indeed scrutinize the methods employed, and analyze the

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\*Read before the Northern Ohio Dental Society, 1912.



principles involved in order to determine the line of demarcation between a simple filling and the full denture.

The commission on nomenclature of the Institute of Dental Pedagogics defines bridgework as follows: "The adaptation of artificial crowns of teeth to and over spaces made by the loss of natural teeth, by connecting such crowns to natural teeth or roots for anchorage, thereby dispensing with plates covering more or less of the roof of the mouth and alveolar ridge. Bridges are fixed or removable. They are attached to abutments or bands, crowns, open-faced crowns, bars, inlays, hoods, pin and sockets, telescope crowns and lugs. Bridges are of porcelain, gold with porcelain facings, and all gold."

The same commission defines abutments as follows: "A supporting or buttressing structure to sustain lateral pressure. Any relatively immovable part. The anchorage tooth for a bridge."

Those sections of bridges which are intended to replace or act as substitutes are called dummies and accordingly the commission defines dummy as "An object made to represent something else externally or superficially. Special in dentistry. A tooth in a bridge to supply a missing natural tooth." Technically, therefore, we may regard dental bridge work as composed of an attachment or abutment piece supporting one or more adjacent dummies, or, a series of two or more attachments of abutment pieces supporting one or more intervening dummies, designed to be supported by and attached to the roots or crowns of the natural teeth, called abutments, which, when assembled, not only serve artificially to replace missing natural teeth, but also afford a continuous masticating or incisal surface, and otherwise mimic the functions of the missing teeth. According to the method of attachment or style of construction dental bridgework is classified as fixed or removable.

While the requirements governing the management of both the fixed and removable types of bridgework are essentially the same, yet the mechanical principles underlying their construction in accordance with these requirements, demand special consideration.

The practicability of their application and the indication for their employment together with the details involved in the successful execution of their construction and application is determined very largely through a thorough consideration of the physiological conditions presented in each individual case, and it is only through the intelligent consideration of these factors that the feasibility of the employment of either style can be scientifically determined.

Since this paper is limited to a discussion of "Practical Fixed Bridge-work," further efforts will accordingly be devoted, more or less faithfully to a consideration of those principles and requirements which more especially concern this style of construction.

Bridgework, according to its definition, receives its support principally from the natural teeth, and since, according to its classification, fixed bridge-work becomes an integral part of the denture through permanent fixation,

certain advantages and disadvantages accordingly accrue to its employment and application. Chief among the advantages claimed in its favor may be enumerated the following:

First—The satisfaction afforded by a method whereby the missing natural teeth are more or less successfully replaced and their functional equivalent more closely obtained by virtue of the firmness and stability of this order of substitute, and the possibilities that the method affords of obtaining a more or less efficient masticating surface.

Second—The effectual replacement of missing natural teeth without the deleterious influences that accompany the use of plates and clasps, thus not only conserving the integrity of the remaining natural teeth and the normal condition of the contiguous tissues, but also, through their omission relieving the functions of speech and taste from unnatural impediments.

Third—In view of the modern advancement of this work and the improved facilities available, and in view of the fact that clinical experience and observation have appraised our efforts in this direction, it would seem that the third advantage might be specified as, permanency, durability and efficiency, in a degree at least, which will compare favorably with the success that attends our efforts in other operative procedures.

On the other hand certain disadvantages or objectionable features accompanying the employment of the fixed type of bridgework arise and may be summarized as follows:

First—The mechanical requirements governing the employment of the roots or crowns of the natural teeth as abutments, frequently demand mutilation of sound teeth, destruction of pulp tissue and often require irreparable destruction of tooth crowns.

Second—The disturbances of the normal anatomical relation of the natural teeth that serve as abutments, through their unnatural fixation, the abnormal stress to which they are subjected together with the unnatural work superimposed and performed under such unnatural conditions are factors that may well be regarded as deleterious influences which may, in time, cause loosening and frequently total loss of such teeth through a slow but progressive degeneration of the peridental membrane.

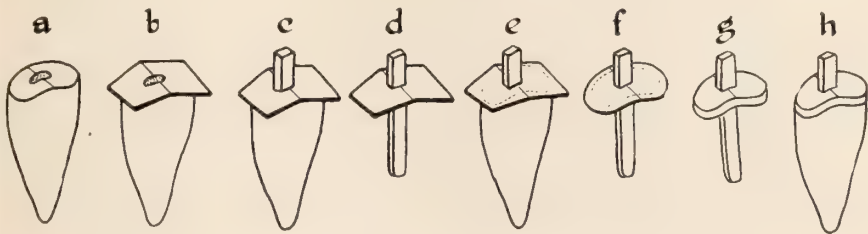
Third—Since the physiological and anatomical requirements are prerequisites governing the mechanical construction, and since, in general, bridgework constructed in accordance with these requirements fails to restore the lost contour of the contiguous tissue which accompanies the loss of the natural teeth, and since not only pockets are accordingly formed which are in direct proportion to this lack of contour restoration, but also inaccessible spaces are created which defy all ordinary efforts of cleanliness, it would seem that the third disadvantage or objectionable feature might be epitomized as follows: All fixed bridgework by nature is unsanitary.

While a thorough consideration of all of the advantages of fixed bridgework as enumerated, may seem discouraging, and while the practicability of this type of bridgework may seem to be doubtful, yet it is well to remember that the employment of bridgework, while in many instances the opera-

tions may seem radical, has for its chief motive the restoration of lost incisal and masticating surfaces, which, if conscientiously planned and skillfully executed, possesses advantages of incalculable benefit that far outweigh many adverse considerations of lesser importance.

Since fixed bridgework is designed to be permanently attached to the crowns or roots of the natural teeth, it naturally follows that, irrespective of the method employed to accomplish this attachment, the stability of fixed bridgework is equal to and in direct proportion to the stability of the teeth which serve as abutments.

Again, since the functional efficiency of a bridge is in direct proportion to its amount of normal occlusion and articulation, and since it is only through strict compliance with the laws of articulation and occlusion that the fullest degree of functional usefulness can be realized, and since the stress of mastication can not safely exceed the physiological resistance of the natural teeth supporting the bridge, it naturally follows that the functional value of this type of bridgework is no greater than the functional value of



the teeth or roots supporting it. It is through the study of these factors which are largely peculiar to each individual case, together with the muscular energy capable of being exerted, and the analysis of the resultant forces of stress as received by the occlusal or incisal surfaces during mastication and in turn delivered to the abutment teeth, as well as the study of the mechanics of leverage, that the principles underlying the application of fixed bridgework are evolved. A careful study of the teeth and supporting tissues not only reveals how wonderfully Nature has designed the teeth that they may in functions be most efficient, but also, how wonderfully she has provided for their support and retention while performing their functions.

Not only the crowns of the teeth, the size, shape number and position of their roots, but the periodontal membrane and alveolar process as well, all seem to have been designed in accordance with the best plan to render them the most useful, not only in the mastication of food, but also for their retention and stability in withstanding the stress and strain of occlusion and articulation.

While the mechanical principles and physical laws governing stress are immutable, and the working energy of mastication is a concrete factor capable of demonstration, yet it seems that these principles, as related to these



factors have never been correctly interpreted or scientifically applied, or at least commonly understood.

It seems incorrect to suppose that four roots designed to bear a strain of two hundred pounds individually, while supporting a bridge of fourteen teeth will be required to withstand a stress equal to the aggregate stress that fourteen teeth may normally withstand.

It seems, on the other hand, more correct and more in accordance with the application of true physiological laws, to assume that four roots supporting a bridge of fourteen teeth can and are required to perform and do the work of four teeth only.

According to the well known physiological laws, muscular development is dependent upon nutrition and exercise and no muscle is capable of exerting more power than its supporting tissues can withstand, provided this power is exerted within physiological limitations.

If the muscles of mastication are capable of exerting a stress of 275 pounds upon the first molars and if the supporting tissues of the first molars have been capable of developing a structure which will safely bear such a strain, it must be concluded that the development of the muscles and the supporting tissues of the teeth are co-incident and in accordance with physiological laws.

It is also true that this muscular power is normally intended to be exerted within physiological directions, and that the supporting tissues of the teeth are developed and physiologically designed to receive and support this strain only when this muscular stress is transmitted to them in a normal direction and according to physiological principles.

The wonderful power that the muscles of mastication are capable of exerting, and the wonderful plan upon which nature has constructed the human teeth in order to utilize this energy in the mastication of food, and the wonderful design of the tissues which support the teeth while performing these functions, all seem to be in perfect accord with the marvelous schemes of Nature. Yet, it must be remembered that this muscular energy is intended to be exerted only within certain limitations, bounded by the normal, that the design of the teeth render them efficacious in performing their functions only when muscular energy propels them normally, and that the tissues which support the teeth while performing their functions are capable of yielding normal support only when the muscular stress of mastication is normally directed.

Therefore, it would not be in accordance with physiological laws to expect a first molar which, if normally capable of withstanding a stress of 275 pounds, and the supporting tissues normally capable of resisting the stress, to physiologically resist this stress if the direction of the stress be perverted, and the supporting tissues compelled to receive the stress contrary to the direction that they are normally designed to receive it.

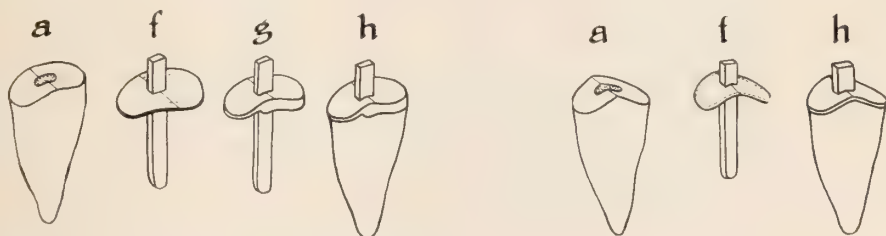
Hence it seems obvious that if fixed bridgework be constructed with occlusal and incisal masticating surfaces after Nature's plan and in accordance with physiological laws governing normal articulation and occlusion.

and if the stress as received by the abutments is normally directed, that such bridgework may be successfully attached to the roots of teeth without inviting pathological manifestations.

But, on the other hand, if fixed bridgework be constructed without due regard for these principles, and the oclusal or incisal surface be so designed, or the attachment so made, as to abnormally direct the resultant force to the abutment teeth, then will the supporting tissues surrounding the root fail to render support, just in proportion as the stress is perverted and the supporting tissues are obliged to offer resistance in a direction which they were never intended to furnish.

From the foregoing considerations the following conclusions may be drawn and regarded as the fundamental principles governing the employment of practical fixed bridgework.

First—The oclusal or incisal surfaces of all bridge teeth must be faithful reproductions of the oclusal or incisal surfaces of the missing natural teeth, and in harmony with the line of occlusion.



Second—The abutment teeth must not receive stress from any direction other than that from which they are physiologically intended to receive it.

From these fundamental principles the following considerations may be drawn as governing their practical application :

First—In order to comply with the requirements and principles governing the anatomical forms and relations of the oclusal and incisal surfaces, full upper and lower models should be obtained and mounted upon an anatomical articulator, in relatively normal anatomical relation.

Second—In order to comply with the principles governing the management of stress, the abutment teeth should not be required to support dummies that are attached in a manner to pervert the normal direction of stress through leverage.

In compliance with and in accordance to these fundamental principles, together with the consideration governing their practical application to fixed bridgework, the following general rules may be formulated :

One central root will support one central crown and one central dummy with lingual rest.

Two central roots will support two central crowns and two lateral dummies with lingual rest.

One central or cuspid root will support adjacent lateral dummy with lingual rest.

Two cuspid roots will safely support two cuspid crowns and intervening four dummy incisors.

One cuspid root and one molar on the same side will safely support dummies, supplying the intervening teeth.

One cuspid or bicuspid root will support one adjacent dummy excepting the first molar, and the first molar will support adjacent second bicuspid dummy.

While these rules are formulated for convenience, to cover a large number of cases which are more or less typical, yet they are all fundamentally based upon the application of the same principles which have been pointed out, and could therefore, be condensed into one general law which would apply to all cases and furnish a safe plan for guidance and procedure in the application of all fixed bridgework as follows:

All fixed bridgework of straight alignment should be attached to, or supported by, one or more abutments at each end and should receive additional attachment or support from one or more intervening abutments when of curved alignment.

If this law is based upon sound mechanical principles, and if the physiological laws governing occlusal stress have been correctly interpreted, then, mechanically, the indications and contraindications for this type of bridgework are considerations which find a ready solution, and may be intelligently and definitely decided.

Practically, then, according to this law, in a case where the first, second and third molars on the same side of the arch are missing, a fixed bridge attached to the second, or first and second bicuspids would be contraindicated; even though a saddle be employed, it would seem more correct and more in accordance with good mechanical principles to make the bridge of a removable character.

While the majority of these principles should be recognized and thoroughly understood in the full significance of their fundamental importance, yet success cannot be achieved through their observance alone unless a like degree of respect and consideration also be accorded the health and welfare of the living tissues involved, together with the scientific and skillful management of the surgical and operative procedures pertaining to the preparation of the natural teeth or roots which serve as abutments, the methods of construction of attachment pieces and the management and construction of the dummies in relation to the abutments and contiguous tissues, as well as the materials employed.

Through the consideration of these factors and from the study of their demands are evolved the following requirements, which, classified and arranged according to their relative importance, are physiological, hygienic, mechanical and cosmetic.

The physiological requirement receives its dignity and importance by virtue of the manifest desirability of placing the abutment teeth or roots



and also the contiguous tissues in a perfect state of health, the preservation of this condition and the adoption of such preventive measures as will, to the greatest degree, reduce the liability to occurrence of troublesome and destructive pathological conditions.

This in a general way, from a physiological viewpoint, includes the treatment and elimination of abscess conditions, resolution of all inflammatory conditions, and the destruction of the dental pulp except when contraindicated, and aseptic filling of root canals when necessary.

The physiological requirements may be said to embrace two separate considerations, first, that of obtaining health in the tissues involved, and second, the feature of maintaining their health. And further, while the two considerations which constitute the physiological requirements may be said to concern more immediately the abutment teeth or roots as of first importance and the contiguous tissues as of second importance, and while, accordingly, the mechanical requirement governing the construction of the abutting or attachment piece and the construction of the dummy teeth, may be said to apply to the former as of first importance and to the latter as of second importance, and since it is largely through the management of the details of construction as governed by the mechanical requirements that the second physiological consideration is observed, and while it may seem that the physiological considerations and mechanical construction are accordingly so closely related and interdependent as to preclude any intermediate requirement, yet all efforts directed toward their observance will be rendered futile if the health of the abutments and contiguous tissues are jeopardized by the presence of a septic bridge.

In view of the importance of producing bridgework which will admit of perfect sanitation, and in view of the fact that this feature of oral hygiene relative to and in connection with fixed bridge construction as a whole, quite frequently demands that special thought and study be given the subject for scientific solution, and in view of the fact that its practical application and execution in accordance with this solution, very often requires that creative and inventive faculties be exercised in a special manner, it would indeed seem that this concerted effort in compliance with these definite demands, includes special consideration of sufficient importance to be regarded as a separate requirement, and could most properly be designated and classified as the hygienic requirement.

Indeed while the physiological, mechanical and cosmetic requirements are at all times of the most exacting importance, and the methods of construction in compliance with these requirements often demand skill of the highest order, yet it would seem that the hygienic requirement renders all of these of secondary importance, and might be properly regarded as a consideration of paramount importance and as one of the governing factors in determining the indication or contraindication for certain types, and as the dominating influences at all times regardless of the type, in the management of construction and execution of details.

The great importance of this requirement, therefore, seems to justify and warrant the following assertions and conclusions:

First—The employment of a “saddle” in connection with fixed bridge-work is contraindicated.

Second—If the employment of a “saddle” is indicated in order to gain support, lend stability or to facilitate large restorations of lost contour, then the bridge should be of a removable character.

Third—The surface of the dummies which are adjacent to and approximating the soft tissues should be smooth, well rounded and so designed and finished that all septic matter may be easily removed.

The question may well be asked, when will the dental profession learn that all fixed pieces of dental bridgework are mechanical contrivances whose uncleanness is in direct proportion to their extensiveness; that indifference to the hygienic requirement of construction borders very closely upon criminal carelessness; and that every effort should be exerted to safeguard the health of those who are in need of this class of dental prosthesis, first, by employing only those styles of construction which are favorable to cleanliness, and second, by managing every detail of construction with one definite object in view, namely, of rendering every surface accessible and favorable to the cleansing action of the tooth brush and dental floss.

The construction of fixed bridgework in accordance with these two requirements, therefore, in turn makes certain demands of a mechanical nature, and these demands together with the principles governing the application of fixed bridgework constitute the third requirement which will be considered and classified as the mechanical.

The physiological and hygienic requirements are so closely allied with the mechanical requirements that a discussion of one necessarily involves the others, accordingly, many references have already been made to the mechanical requirements and any further discussion of the latter will in turn involve the former.

As has been stated, the physiological requirement may be said to embrace two separate considerations, first, that of obtaining health in the tissues involved, and second, the feature of maintaining that health, and further, the two considerations which constitute the physiological requirements may be said to more immediately concern the abutment teeth or roots as of first importance, and the contiguous tissues as of second importance, and accordingly, the mechanical requirements governing the construction of the abutment or attachment pieces and the construction of the dummy teeth, may be said to apply to the former as of first importance and to the latter as of second importance.

It will be seen from the foregoing that the discussion of the mechanical requirements involves, first, the consideration of the mechanical preparation of the abutment teeth or roots, the construction and adaptation of the abutment or attachment pieces, and second, the construction and management of the dummy teeth and assemblage. Of all the requirements, those classed as mechanical are as a rule, the most generally and thoroughly understood,

and since they are likewise, as a rule, the most thoroughly and generally disregarded, it might be well again to repeat some of the stock expressions, used in discussing some of the essential factors which are commonly regarded as prerequisites to success.

First—When full or partial shell crowns are to be used as attachment pieces, all walls of the remaining natural crowns should be at least parallel as in the case of individual crowns, likewise, the use of lugs, bars, inlays, partial crowns, dowels and the like which are intended to be used for attachment pieces, and which are to become integral parts of the bridge, demand that the same principle of parallelism be observed in the preparation of cavity margins, axial surfaces and canals.

Second—To render possible the proper adjustment of the bridge after assemblage, the axial walls of the respective abutment preparations should present parallel walls. This is also intended to apply to the management of root canals in case dowel crown attachments are used.

Third—The integrity or strength of union existing between attachment pieces and the supporting abutments should be sufficient at all times to insure permanency and stability.

Fourth—The adaptation of the attachment pieces to the natural teeth should be so perfect and the relation of the dummy teeth to the alveolar ridge and contiguous parts should at all times be so managed as to preclude or minimize the mechanical irritation of the soft tissues.

Fifth—The articulation and occlusion of the occlusal and incisal surfaces of the attachment pieces and dummies should be designed and constructed in harmony with the anatomical and physiological laws, and in accordance with the principles previously considered.

Sixth—The assemblage of the respective parts should be so carefully and skilfully performed as to perfect or enhance rather than to detract or depreciate the finished product, while the strength should always be consistent with the demands of stress.

While the primary considerations in the employment of bridgework is for the artificial replacement of missing natural teeth and could be successfully accomplished by resorting to the judicious application and execution of purely mechanical procedures alone, yet its prosthetic value can be greatly enhanced by combining with our mechanical skill the highest type of artistic attainment and ability of execution.

Esthetics and cosmetics have so largely entered into the actual progress and exercised such a marked influence on the scientific development and application of bridgework that perhaps no other phase of dental art can lay claim to the individualism that characterizes modern dental bridgework.

While the cosmetic requirements embrace a field of innumerable opportunities and possibilities, bounded only by the limitations of man's resources, and while art can never hope to duplicate the creations of nature, yet the opportunities presented wherein nature may be successfully imitated and the possibilities offered wherein the artificial may be rendered inconspicuous or unnoticeable, are great indeed, and accordingly will always appeal



strongly to the individuality and artistic temperament of every progressive operator.

The popular estimation of bridgework seems to be inseparably associated with the idea of mechanics, yet its conception and successful application depends entirely upon a practical knowledge of anatomy and physiology and the closely allied sciences of pathology, and therapeutics, and it seems quite certain that the employment of bridgework in general, would meet with more universal success, if those who perform these operations would more exhaustively familiarize themselves with the anatomy, histology, physiology and pathology of the living tissues and structures involved, and accordingly make bridgework subservient to them, and therefore regard mechanics only as an incidental but necessary procedure in their construction.

#### QUOTATIONS FROM EVANS, GOSLEE AND BLACK

"The teeth which support the bridge are required to bear more force and pressure than nature intended—where the piece is large, many times more—and, the bridge being permanently attached, at no time can any rest be given the abutments or the contiguous parts by its temporary removal.

Thus in a piece of bridgework of fourteen teeth supported by caps or crowns on four natural ones, each one of the natural teeth may have to bear more than three times the strain, etc., etc., than was intended."—Evans, July 17, 1905.

"Bearing upon the requirements in this particular, it has been previously stated that by uniting two or more teeth 'the movement of each is so modified and restrained as to enable them to successfully withstand more force than the sum total of their separate resistances,' etc.—Goslee, August 22, 1910.

"The force of the bite, or the pounds force with which the jaws may be closed upon an object, varies greatly among different persons, and is dependent in larger degrees upon the condition of the peridental membranes and upon personal habits in the use of the teeth in mastication than upon muscular power."

"The force of the bite of an individual is modified very materially, (1) by the use habitually made of the teeth, (2) by the loss of the pulp, (3) by disease of the peridental membranes."

"In disease affecting the peridental membranes, the power of the occlusions is rapidly reduced, that is, the muscles of mastication are held from exerting their full power by pain warning them to go no further."

"Therefore, the limitations of the force of the occlusion as shown by the gnathodynamometer is a register of the power of resistance by the peridental membranes and not a register of possible muscular exertion."—Black.

## DISCUSSION

DR. W. O. HULICK, Cincinnati: Dr. Bush has given us the most valuable and complete essay on bridgework I ever have had the pleasure of listening to. I quite agree with him when he says this branch of dentistry presents innumerable opportunities for exerting skill and judgment, but must admit that some have not as yet over-exerted themselves, or have never had either skill or judgment. Students in our colleges have this subject presented to them by our ablest men and should be perfect in the art when turned loose on the public. Now these same men, Drs. Bush, Goslee, Johnson and Evans, and many others I could name, are continually writing and demonstrating to us the wonderful possibilities in the scientific, esthetic and mechanical opportunities and yet many of us continue on old lines, making failures, causing infinitely more harm at times than good. I believe in all sincerity that it is the most abused of any branch of our profession. Many operators, from a purely commercial view point, disregard the fundamental principles, mechanical laws and practical usages, overriding the obligations imposed on them. I believe more teeth are lost by faulty construction, misapplication of force, lack of knowledge, or a total disregard of the pathology, physiology, mechanical principles and requirements than by any other cause, also more sepsis is caused by the pockets and faulty construction and misapplication referred to in the essay than we dare admit. This should not be, when the subject is analyzed so beautifully as in the essay just presented. We should be able to differentiate between right and wrong, know where bridgework is indicated and where contraindicated. Do we all understand the physiological requirements? Do we all understand the mechanical requirements? Do we all understand pathology, anatomy, physiology and therapeutics as we should? Permit me to call your attention to a few thoughts from which to draw some conclusions. In the creation of man, the teeth were expected to do good service during the lifetime of the body, biting off, grinding and thoroughly preparing the food before it passed into the alimentary tract. They were arranged in mandibles, the lower in condyles, so that in the act of mastication, they rotate and glide over each other without forcing their antagonisms or themselves out of alignment. Do you know how much work is required of the teeth in this act? In an ordinary meal we have from 800 to 1,200 closures or triturations of the jaw, while in an average, or extra large meal, it will be from 1500 to 2500. Another important feature is the crushing force in the act of mastication. Twenty-five, fifty and perhaps one hundred pounds pressure is required at times to grind certain food. We would conclude from these facts that it is necessary to have a complete arrangement of teeth to perform this natural function. This brings us to another conclusion, that, with the loss of one or more of these natural organs, the general arrangement is changed, mastication is impaired, assimilation is faulty and many times health impaired to a greater or less degree. Now, it has been demonstrated beyond peradventure that the grinders are necessary and when lost must be restored by artificial means. Dr. Bush describes bridgework technically, physiologically and mechanically, giving us the essential principles underlying its construction in accordance with the aforesaid arrangement, leaving some of the practical applications, possibilities and failures to others. Have you ever considered or calculated the amount of service required of bridgework, taking a four-tooth posterior replacement as an example? If not, now is a good time to think. The teeth supporting supplies are required to do their own work, also the work of those which are supplied, to my mind, reducing the crushing force, and to a greater or lesser degree their utility.

Referring to some quotations in the essay, that in the case of a bridge of fourteen teeth supported by four natural ones, each tooth will have to bear more than three times the pressure than nature intended. Again in other quotation, by uniting two or four teeth, the movement of each is so modified or equalized as to enable them to successfully withstand more force than nature's requirements. I take it that the essayist has taken exception to these quotations, when he says four roots supporting a bridge of fourteen teeth as referred to in the quotation, can and are only required to perform and to do

the work of four teeth. Or in other words, it would seem according to physiological laws, a tooth was intended to do its own work and no more for the given time allotted to man. Therefore, as previously stated, any undue pressure, stress, unequal or over-work, will according to physical and pathological disturbance, cause its loss in an unreasonable length of time. I quite agree with him on these points. I wish to call your attention to some facts, which will disprove the aforesaid quotations referring to the utility, physiological and pathological laws of a 14 tooth bridge with four attachments. We will take for instance the average closures to be 1000 per meal. A low estimate, making 3000 per day, or a grand total of 1,095,000 triturations at the year's end. Now think twice—50 pounds would be a fair pressure average for roast beef, steak, or other meats used by most persons at least twice daily, requiring from forty to sixty closures or triturations, for each morsel or bite before it is thoroughly masticated, a person consuming at least ten bites per meal.

It would seem from the foregoing facts that any bridge replacement would be temporary in its servitude and especially so with a large restoration. However, if the pathological conditions are favorable and mechanical laws have been complied with, the physical conditions will generally change to accommodate the situation. 'This being the case, the individual habits change, force of mastication or pounds pressure becomes less and less involuntarily, nature providing somewhat for this unnatural arrangement and trying to shield or protect the tooth in this extra work imposed.

In a careful study with observations covering a period of nearly twenty-five years, I find efficiency depends altogether upon—first, the fundamental principles of mechanical and natural laws; second, the pathological and physical conditions.

Now, listen again; I wish to quote from Dr. Bush: "First, the occlusion of incisal surfaces of all bridge teeth must be faithful reproductions of the occlusal, or incisal surfaces of the missing natural teeth and in harmony with the line of occlusion.

"Second, the abutment teeth must not receive stress from any direction other than that from which they are physiologically intended to receive it."

Failing to carry out these natural principles, the incisors will be forced out of alignment, grinders out of occlusion, and there will be physiological and mechanical failures. The final conclusions are, therefore, regarding these fundamental principles: imitate Nature in every particular if you wish to obtain satisfactory results.

Art and science have become so closely allied there seems no logical reason for failures under favorable conditions. However, the conditions are seldom so after the loss of one or more teeth, or in case of sore, sick and abscessed teeth that have been cured but are still somewhat lame, these teeth that have been inactive for years elongating and are not well rooted. Last, but not least, malposition which is most aggravating and is always found where there has been early extractions. In all of the conditions mentioned incisors are out of alignment, grinders out of occlusion, and many times a replacement of any kind is most difficult and not always satisfactory. To avoid some of these conditions it would be well to insert replacements as soon as underlying tissues are in condition after extraction.

Referring to paragraph in the essay, Dr. Bush says: "One cuspid or bicuspid root will support one adjacent dummy, excepting the first molar, and the first molar will support adjacent second bicuspid dummy."

I wish to take exceptions in part, for the essayist has contradicted a former paragraph, namely: "The abutment teeth should not be required to support dummies that are attached in a manner to pervert the normal direction of stress through leverage." Observations have led me to believe two supports for a bicuspid or molar dummy supply are necessary. In case of any single molar dummy supply being attached to one support, the occlusal stress will be from 50 to 150 pounds, making the leverage so great as to tip over out of occlusion; also, the dummy will at times become imbedded in the underlying tissues and has been known to cause necrosis of the jaw. This same condition might also happen in bicuspid dummy supported by either first molar or other



bicuspid. This same condition has happened in anterior single replacements. However, the most common cause for failure in this form is rotation of supports from impaction, by which the supply will be forced out of alignment.

I wish to bring to your notice a practical application, demonstrating some of these conditions. The bicuspids were missing on the left side of the lower mandible, while on the left the second bicuspid and first molar had been extracted for a number of years, remaining teeth becoming malposed. In this case molars on either side were engaged as the only supports, which soon tipped over out of occlusion, and no service was obtained from the replacement. In correcting these cases the same molar roots were engaged, gold cap crowns on natural lines were made, the dummy supplies carved also on natural lines to extend to top of ridge line only, with supports resting on inlays in first bicuspid and cuspid respectively. The technique of this work will be interesting to some of you and may be seen at Rostrum 4. This form of replacement is an invariable rule with me for one dummy lower, while the upper would differ only in form of supply, a porcelain dummy with lingual support of gold would be used with rest in gold inlay fastened to a remaining tooth. In these small replacements, in upper or lower, the inlay attachment may be employed to attach dummy, using the double inlay for other support, it not being necessary or advised to make both supports fixed, failure resulting from this method, partly due to difficulty in getting an alignment, also the great amount of stress in mastication, causing fracture of tooth wall at times and a loosening of one and often both anchorages. In this form of replacement we have a natural movement of the natural teeth, insuring longer service.

Change of investment, contraction of gold in uniting the several parts in a large bridge, where inlay anchorages are employed, will often result in faulty adaptation, which might be overcome somewhat by making bridge in two parts and resoldering. The inlay attachment is successfully employed in large posterior replacements, where anterior tooth is engaged. After devitalization a cavity is made sufficiently large to receive gold inlay strong enough to carry dummy. In this form of attachment the double inlay should at all times be employed, to avoid conditions above mentioned. The first inlay should be made of pure gold, or platinum strengthened, and held into cavity by a tube or barrel closed at one end, cemented to place. This inlay will protect tooth cavity against the possible faulty adaptation of second inlay attachment. You will conclude from the foregoing remarks that I am not very favorable to inlays for large replacements, and only partially so in any event.

As previously mentioned, one of the most perplexing conditions is malposition, or conversion, resulting from early extraction and delay in inserting replacements.

In this event it is, in many instances, impossible to get alignments that will insure satisfactory results, where two or more dummy crowns are employed, resting on two supports, all united in one piece.

Many methods have come to our notice for these perplexing conditions, the most practical, to my mind, and employed in some form by me for nearly fifteen years, is the separate post, which can be employed in the most aggravated cases.

Should a cuspid root be engaged as one support, a Davis, Goslee, or other pinless crown can be used, with inlay or other rest used to engage dummy; the post is not to be soldered, but is to be inserted separately when completed bridge is cemented to place, when the cuspid crown can be placed in position. This separate post has also been employed by me very satisfactorily where a Richmond crown supply was used, by making countersunk hole in lingual base of gold support, inserting headed post after completed bridge was cemented in position.

In case of Davis, Goslee, or other pinless crown with inlay rest, a cap should be made, with tube attached as previously described, cemented permanently to place for inlay to rest on; said inlay should be made wedge shape from the lingual to give sufficient strength to carry dummies.

It is written somewhere, that "a thing of beauty is a joy forever," but it would seem from some of the foregoing paragraphs, teeth separated, malposed and out of alignment and occlusion, a replacement would not be a "thing of beauty or a joy forever," for such replacements must carry out mechanical and pathological requirements, which at times precludes the esthetic effect.

Some of the difficulties in these malpositions are to get contact points, also the preserving of the interdental spaces.

This can best be accomplished to my mind by the carved method, using a very thin band, well fitted to root, carving any contour that may be required, according to the natural arrangements.

By this means a gold cap crown can be made to so resemble nature, that little or no inflammation is present, either from the band, or impaction between the teeth.

The essayist has successfully presented the pathological, physical, mechanical, scientific and esthetic possibilities and opportunities. He has given you the fundamental principles relative to the anatomical conditions, normal and abnormal. He has pointed out the rules governing supply and demand, the practical and scientific attainments.

In discussing this very able essay, I have only tried to add a few practical thoughts, making, at the same time, some observations, and conclusions that may help some to discharge the great obligation imposed in them, and to meet conditions and do the best that is possible with the case as presented.

I wish again to compliment the essayist and congratulate the society for having had the privilege of such a presentation of this subject.

DR. S. M. WEAVER, Cleveland: I wish to compliment the essayists, both Dr. Bush and Dr. Hulick, for the complete discussion they have given us on bridgework. In college we were taught that we should always supply as small a bridge as possible, make them small instead of large. In my experience, during the last twelve years, I have found that the larger the bridge the more service it will give, providing you have the proper number of abutments. I make my bridges just as large as I can instead of making them as small as possible. To illustrate: I had a case some two or three years ago, with eight abutments, all loosened by disease. Some of the teeth were so loose I had to hold them in with my fingers while I treated the canals. I never expected to save them, but thought that I would treat them to see what I could do. In about three weeks after they were treated, they were in very nice shape and almost normally tight. After these abutments were properly fitted with separate copings, each having a threaded receptacle in the top, the main bridge all in one piece, was set in cement with an iridium platinum screw passing through each abutment cap into the base coping. Those teeth have been in about three years and are apparently in perfect condition with not one place showing irritation. It was something of a revelation to me to think that we could take these loose abutments and make a solid piece of work. There is absolutely no movement, and I believe the work will give perfect satisfaction for several years to come.

I think Dr. Bush said that saddles in bridgework were contra-indicated. I believe, for sanitary reasons, that there are many places where the saddle should be used. With a saddle, for instance, from a second molar to the first bicuspid or cuspid (of course you have to have a certain amount of recession). The area against the gum in this saddle is not as large as the combined approximal surfaces in the natural teeth, if they were in position; in fact, just about half that area. Now if the approximal space is not cleansed very often, as very few people use floss between those spaces, the saddle will be just twice as sanitary as the natural teeth. I have had two or three bridges removed after they have been in the mouth five years. One on the lower jaw, and when that bridge was taken off the underside was just as bright as it was when put on, and the tissue underneath carrying the imprint of the saddle in it was perfectly normal and without irritation. The work has to be perfectly polished and adapted and put in the mouth temporarily for two or three weeks, allowed to settle to the tissue, and if there is any irritation the bridge can be taken out and polished off so that you can get perfect adaptation.

It necessitates very close work. In many cases, however, they are by far the best piece of work you can put into the mouth, because using the brush cleanses the outside and there is no room for food between the gums and saddle. There are lots of cases of which Dr. Bush spoke about restoring teeth just as nature made them that I wish to take issue. Take a molar tipping way into the mouth; I would straighten that tooth up, instead of leaving it inclined into the mouth, by bringing the crown straight up you will bring the force of mastication directly over the apical ends of the roots and lengthen the service of that tooth to the patient. If it is straightened up it is worth three or four of the others. We have to improve on Nature, as Nature has left things in many cases badly mixed up; we have to jump right in and do lots of things in bridge work, by restoring deformities, that in my mind a great deal better appearance than to reproduce them uncorrected.

DR. WHITSLAR: I want to ask the doctor a very important question. He described a beautiful restoration of roots on which he puts removable bridgework. I want to ask if that is what is called "alveolar dentistry?"

DR. E. E. HALL, Columbus: I don't know as I can add anything to the discussion of this paper except that there is one point in Dr. Bush's paper that perhaps is not as clearly brought out as it was the other day in a discussion with him personally, and that is the stress that an abutment is compelled to carry. It is not multiplied by the number of teeth on that abutment, because that cannot increase the original amount of muscular force that there is to exert. In other words, if you had, say a weight of 200 pounds and you used old-fashioned steel yards and connected four or five of them and found out the weight; does the load weigh five times the 200 or does it weigh the original 200? You cannot increase that for the simple reason that you have no physical power to increase it. You have your 200-pound weight to begin with. That feature of it has not been as thoroughly discussed, and it is a very strong feature of the paper, so I thought I would like to have that much to say to you. I thank you.

DR. L. L. BARBER, Toledo: I have not much to say on the paper, but would like to emphasize one point, because it has come under my observation many times. I made the mistake myself, and I have seen dozens of other mistakes since. I have discarded that method. That is the method of attaching bridgework to a cast inlay. I believe one of the most faulty ways that we have of attaching bridgework is by ordinary gold inlays. There are cases where it can be used and used successfully, but the way it is ordinarily done it is against almost all principles of mechanics and everything else. It is almost impossible to get your inlays alike, so that they will go back to place. In the next place, if you have two inlays that are carrying one or two dummies, any ordinary inlay will be loosened; that is to say, the inlay having the least attachment will be loosened almost invariably.

I believe Dr. Hulick said something about that; that is, for instance, if he was going to bridge from a second molar to a second bicuspid, or the first bicuspid, he would make a gold crown over the molar, make an inlay with a socket in it and set it in the bicuspid; take a wire and when you have your wax model, press the wire into it and get the shape; take it out and solder that to your bridge, and set it in the inlay. The tooth has its individual movement and it seems to me it will do very much better service than it would otherwise.

DR. E. B. LODGE, Cleveland: We have listened to some very interesting papers on the subject of bridgework, and now probably the most important feature about bridge-work is that it be made hygienic. That fact cannot be emphasized too much, but at this moment I am particularly interested in a point that was largely ignored, and that is the point of esthetics. The bridgework that I have had a chance to see predominating has been that of the most disagreeable character, that is, it has been unsightly and obtrusively so. I want to raise my voice against the unnecessary and abominable use of the



gold crown in front or on any teeth other than the molar teeth except in rare instances where the bicusps may be utilized.

Something has been said in reference to the inadequacy of inlay abutments. Now I thoroughly believe that the inlay, produced by the artificial stone, or by some other method, is permanently indicated for the support of one tooth, for instance a lateral incisor, where the cuspid is resorted to for an abutment; and in that instance you use a Carmichael abutment possibly with post or dowel; but there is one of the instances where it seems to me the inlay is preeminently indicated.

DR. E. C. MILLS, Columbus, O.: One important point in the paper was the matter of stress that can be brought to bear upon a tooth. I think the essayist, or Dr. Hulick, said in discussion, that each tooth would stand a stress of 200 or 275 pounds. Now I do not think that it is wise for us to go away with the impression that one tooth or any three teeth will stand the amount of stress that 22 or 32 teeth will stand, because from our experience perhaps in inserting an inlay, filling or putting on a crown, if a little full and it occludes a little more forcibly than the other teeth, the next day, or possibly later, the patient will complain of soreness about that locality, showing that one tooth cannot stand the stress that any number of teeth can stand. For that reason we cannot assume that one tooth is capable of standing the same amount of stress that the full complement of teeth will stand. Now it has been shown that Nature, who is ever a fond parent to all the organs of our body, will remedy things and make certain adjustments in them, as Dr. Bush alluded to; that it will control the exertion of the muscles in bringing on tension or stress. Now I think in the mouth the greatest pressure that can be brought when full dentures are worn is in the neighborhood of 65 or 75 pounds, and with the natural teeth, 75 to 275 pounds averaging about 170 pounds. That is, pressure is brought on, not to the extent of the full muscular force, but only to the capability of the soft tissue to stand the stress. Now in elongating the bite in any one or two teeth, we are overtaxing the amount of stress that the periodental membranes are capable of standing; and the minute we increase that beyond the amount that is supposed to be taken care of by each tooth, there is trouble. Suppose we have lost most of the natural denture; Nature has by then so regulated the stress through the muscles of mastication that we exert on the sockets of the remaining teeth, so that at any time in life, whether we have twenty teeth or ten teeth in the mouth, we will not bite on any one tooth to overtax the periodental membrane and have soreness.

DR. PRICE: A question I wish to ask Dr. Bush or Dr. Hulick is this: Whether or not there is any substance or material that we may put around the teeth that is as acceptable to the normal tissues as is normal tissue itself, and in answering this I want you to make this application of it: Is a tooth with an inlay, a large inlay, as strong as will be necessary to carry the weight; as for example a fused inlay with post entering the root; is this not preferable to a gold band going around the root as an anchorage?

DR. HULICK (in answer to Dr. Price's question): I wish to make this statement, that any band is an irritant, to a greater or lesser degree, in accordance with operator's ability to adapt same to tooth root.

Platinum, perhaps, is the least irritating, inasmuch as it can be used very thin at gum margin and is, consequently, more easily adapted.

Platinum, or plat. iridium No. 40, should be used more frequently at the gum margins, using 22k gold plate to finish out band, or crown, toward occlusal or incisal surfaces, which can be made to more nearly represent enamel surfaces and would cause little or no irritation at the cervix.

As to inlay attachments referred to by Dr. Price, I believe certainly that a filling or inlay, of any kind, is less irritating at the cervix and should be employed wherever indicated. I especially wished to emphasize large inlay attachments where no posts are attached to the inlay, or other fillings so employed, for large bridge replacements.

In these cases there is so much stress in mastication, along with lateral motion, as to fracture tooth wall or loosen one of the inlays so employed as rests for bridge. Also inability to get proper alignment of inlay and proper adaptation of inlay to tooth structures in finished piece.

In my discussion of Dr. Bush's paper I only wished to bring out the inlay attachment in connection with the post and double inlay method in cuspids and other anterior teeth to be used as supports to bridge.

I believe I excepted inlays in molar and bicuspid teeth for small bridges, where one end of bridge has a rest in an inlay in one of the teeth used as a pier, thereby giving a rotary motion in the impact of mastication.

This method is most satisfactory and precludes the possibility of fracture of tooth wall or loosening of one of the inlays, which may and has happened. Any inlay or double inlay, with post attachment, is less irritating than cap, crown or band around root of tooth and should be employed where indicated.

Dr. Mills does not quote me correctly. I said the first molars could withstand a stress of 200 to 275 pounds and that with the addition of one or more teeth the crushing force was diminished—and that I did not advocate large replacements; that four teeth would not carry a fourteen-tooth bridge for any great length of time.

DR. C. D. PECK: I will request Dr. Bush that he elaborate a little on to what extent he devitalizes teeth before an abutment is put on.

DR. BUSH (closing): I confined myself in the paper, first, to the principles of fixed bridgework, and second, to the requirements. I did not discuss technique or methods.

In regard to the first question of Dr. Weaver, regarding the use of the saddle in connection with bridgework, I said in my paper that in view of the physiological and especially of the hygienic requirements, I did not think the saddle a good thing in connection with fixed bridgework, but if a saddle is indicated then it certainly should be used, but it should be used only in connection with bridgework of removable character. I think its prosthetic value is great; there is nothing that will admit of the artistic possibilities or increase the range of our possibilities in this direction so much as the employment of the saddle; the results are excellent when the saddles are skillfully made and skillfully adapted, but I mean to say that they should not be used in cases which are made unremovable.

In regard to the 275 pounds, I used that in connection with the first molar for convenience and for the sake of illustration only. Dr. Black found that some individuals can exert that many pounds' force on their first molars. I did not mean to say that all teeth in the same mouth were subjected, or even required, to bear that much stress. As a matter of fact, the average force of the bite on the molar teeth is about 170 pounds. However, if we cannot exert more than 65 or 75 pounds on any one tooth, as stated by Dr. Mills, I will have to apologize for quoting Dr. Black.

In regard to the stress control, you must not forget the fact that there is a physiological control over the muscles of mastication. It is hardly possible for us to bite more than a tooth can stand provided we keep the direction of stress within the normal. It is the correct interpretation and application of the principles of physics and physiology, as related to the application and construction of fixed bridgework, that I have been trying to point out to you. In this connection there is a physiological control exercised over the muscles of mastication that seem to involuntarily assume control of the organs of mastication for their physical protection and seems to be accorded to them in conditions of health and disease alike.

If the stress of mastication is imparted to the periodontal membranes of the roots which support bridgework in a normal direction and the periodontal membranes are preserved free from irritation, then the full functional usefulness of the roots and the bridgework supported by them is realized. But if the direction of stress is perverted or abnormally directed to the periodontal membranes through improperly articulated bridgework, or the periodontal membranes condemned to exist in a chronic state of in-

inflammation because of imperfectly fitted attachment pieces, then the functional value of the bridgework is decreased just in proportion as the periodontal membranes of the abutment roots have been debilitated.

If an individual has difficulty in masticating beefsteak that should be easily divided with 50 or 60 pounds' force on bridgework supported by roots that should normally withstand two or three times that amount of bite force, then it is no more than justice to say that that individual is being denied the full enjoyment of his rights.

When Dr. Peck asked his question regarding my views of devitalization I think he had shell crowns in mind.

The feasibility of devitalization is a long story, but to make it short and to give Dr. Peck a definite answer, I will say that I devitalize the pulps of all teeth that I crown except in those cases when their removal is contraindicated, and in so doing I consider that I am following conservative practice.

This includes perfectly sound teeth as well as those which have been partially destroyed by decay, for the conditions and reasons which render devitalization advisable apply equally to both cases.

If this procedure seems too radical in the case of sound teeth, then the use of the shell crown should be abandoned and some other form of attachment or restoration should be employed.

The contraindications to devitalization in the employment of shell crowns are age and malformation.

Devitalization is practiced in this connection for two reasons, first to facilitate the mechanical preparation of roots, and second, to avoid the consequences that attend the death of the pulp.

The first reason is of immediate importance and includes two features. First, the patient's comfort, and second, the increased possibility of obtaining perfect root preparation without interference. The second reason is more remote but of no less importance. I am convinced that it is only through the adoption of this practice that I am able to comply, to the fullest extent, with the physiological requirements.

In answer to Dr. Price's question, I will say that I agree with him. The use of a band around the neck of a tooth should certainly be avoided if possible.

Everything else being equal, the use of the inlay attachment possesses advantages over the banded forms because of the opportunities offered to a greater degree of complying with the physiological requirements.

### THE MAN WHO KICKS

"Philosophers may tell you that an everlasting smile  
Is better than a mixture, half-and-half,  
Of smiles and frowns used alternately every little while,  
And that the world will love you if you laugh.

"But I have often noticed that the man who is always kind,  
And smiles no matter how hard he's been hit,  
Gets what the kickers wouldn't take; and you will always find  
The man who kicks some gets the best of it."



## THE PATHOLOGIC FINDINGS OF SOME DISEASES OF THE TEETH AND GUMS.\*

By V. A. Latham, M.D., D.D.S., Chicago, Ill.

**M**ODERN dentistry, compared with that of about forty years ago, gives us cause for rejoicing in the great progress made in technical and, to some degree, in scientific directions. This now enables us permanently to preserve large numbers of teeth which formerly would have fallen victims to the forceps. When the masticating apparatus, through loss of teeth or of their crowns, has caused more or less disturbance in important functions, modern methods of dentistry make it possible to restore a fully serviceable condition for mastication; appearance and speech may also be improved. True, there is still room for much improvement, and I am glad that Dr. William Hunter made a bold attack in the press against unhygienic mouths due to faulty prosthetic work. For years I have urged that some attention be paid to this subject, and when "Oral Hygiene" was

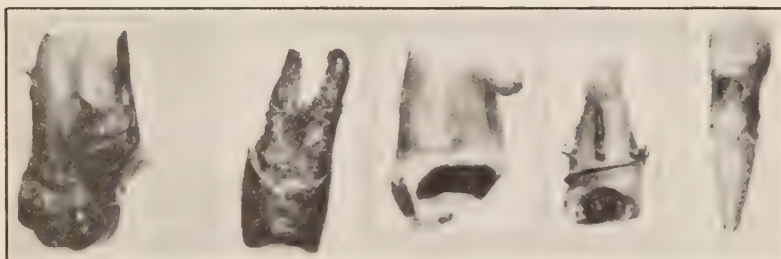


Fig. 1.—1, steel probe through crown and cervical margin into the process; 2, gold cap; 3, curved root; 4, root canal point and wire left on root in the alveolus; 5, eroded root, peridental membrane lost, pulp atrophied.

first published, Dr. G. Edwin Hunt, its editor, urged an expression of these ideas in its pages and asked me to write upon the diseases of the gums and teeth caused by crowns and bridges, but I thought there were *more* able practitioners to give their experiences and so waited until Dr. William Hunter spoke as a clinician and research man, whose opinion is valued by all true scholarly physicians and stomatologists.

Every improvement in dentistry helps to overcome some abnormal condition. This is shown in the vast changes in the methods of saving teeth, and we owe these methods to the advances in pathology and bacteriology.

Modern aseptic, or more truthfully, antiseptic treatment preserves roots and teeth, these in turn correct the occlusion of the teeth and prevent, by usage, the retrograde resorption of the alveolar structures by controlling its circulation. To offset these good results come the pulp mummifying methods, which are questionable, if we think for a moment of the importance of applying surgical pathology and bacteriology. In the hurry to compete with modern demands the teeth are carelessly filled, some with partially decayed putrid pulps; others are plugged with absorbent wool soaked in chemical agents like iodoform, creosote, ethereal oils. Pulp stones will

\*Read in the Section of Stomatology, American Medical Association, 1912.

in pus and *détritus* of dry and moist gangrenous pulps and all because their histologic characters have not been ascertained by oblique light and color characteristics, as well as by thermal or other tests. When we ask why this was done we are told: "The canals are abnormal," "the teeth are degenerated," "they cannot be cleaned," "they are too small and so we mummify the terminals." In a very small percentage of teeth is such treatment allowable, namely: teeth filled up by calcific deposits are usually better filled than by a dentist; but even then they are a source of danger on account of neuralgic pain through the apical hypercementosis and even fibroid nerves.

While making the pulp studies I reported before this Section many interesting and curious pathologic features came up for consideration. One of the commonest conditions noted was the immense number of pathologic-histologic changes occurring on or about the roots of the teeth, varying from simple acute peridontitis to almost neoplastic formations, the *granulomata*, of some authors, and dentigerous cysts in other cases. Their etiology offered some reflection: If caused by improved root fillings, had not many teeth been crowned and bridges adjusted in cases that should not have been so treated? How many teeth, through crowning, had developed hyperplasia? If ulitis is caused by the ill-fitting crowns and consequent pus discharges, is it not a primary or secondary cause for chronic interstitial periodontitis? Or contraction in the bridge may cause movement of the teeth by lateral motion and thus widen spaces between adjacent teeth like the central incisors.

Every bridge and crown has its own good and bad traits. From the banded collar crown for the front teeth, the shell crown for premolars and molars has been developed. It offers a good substitute for mastication but, unfortunately, its easy adaptation was an error, for it is put unnecessarily on all kinds of teeth, which, if properly filled, might have been useful for years. Gold crowns should be employed only when a filling will not restore the masticating function of a tooth, or when used as pillars for a bridge, but it is not conservative surgery to destroy two or more good organs to implant one. The gold crown has defects similar to the banded collar crown with a facing. Pain is often felt during the construction and fixation of a bridge or crown, and in individuals, those with hypersensitive gums and peridental membrane, dangerous changes can and do take place. The preparation of the root is often defective, causing a bad fit of the edge to the root, thus leaving free spaces for decaying food remains. (Figs. 3 and 7.) These free spaces are mostly seen between the premolars on account of their shape; flesh fibers are forced into the gap at meals and pressure on the gum quickly leads to ulitis and its resorption, or in other cases venous hyperemia, with loss of alveolar septum, while the root is attacked by caries. Whether it is justifiable to destroy pulps of sound teeth for bridges is still a question; the more perfect root technic has done much to gain some favor as the surest way of preservation.

A more careful examination and diagnosis of root conditions should be made in view of the defects in bridge construction, bad root treatments and fillings in canals, malposition and deviation at the apices, hypercementosis,

unsuitable choice of supports and the employment of totally unsound roots, defective preparation of the bridge pillars, incorrect articulation and occlusion, the forcing of the gold under the margin of the gums.

To these must be added the lack of knowledge of mechanics of forces, such as a bridge from the third molar having one screw in a first premolar abscessed root extending to the crowned right upper central, on a most difficult occlusion with mechanical abrasion of the lower incisors and cuspids. No support or articulating surfaces on the left side at all and only three teeth on each maxilla and not in any contact must bring about a serious tension and strain on the articular eminences of the jaws. These conditions result in many neuroses and reflex pains, and when the saddle support of the jaw is lost or very irregular through various degrees of resorption, is it any wonder patients complain of the foetor of the oral cavity, gastric symptoms, constipation, hepatic derangements, headache, vertigo, nausea, to say nothing of the tonsillar and lymphatic infections, with the too common sequelæ pus, rheumatism and arthritis?

The value of the X-ray in deciding if roots should be fitted and retained for bridges and crowns must not be forgotten, both before and after an operation has been made on the teeth; but the dentist should be guarded in using them because the clinical evidence must be weighed with the picture. Artefacts are very common and the use of a small two-inch film is advisable, as a larger photograph by Dr. Hænisch's method gives the relations far better.

Another cause for pathologic findings and peridental irritations and sequelæ lies in the common use of the newer chemical compounds without due consideration. Over-treating is almost as bad as under-treating, the idiosyncrasy of the patient to inflammations by irritants must be borne in mind, and it "is not only what we put in the root canals but what we take out that brings results." The preservation of pulpless teeth owes much to the careful work of Adolph Witzel (1874), who introduced the use of carbolic acid, though it later was rejected for coagulating proteins. Ostermann (1875) used salicylic acid, which later eroded the apical area; then came salol, lysol, etc. In 1885 A. Witzel advocated a 20 per cent solution of corrosive sublimate, which was rejected because it caused blackening of the tooth, due to the mercury, and because it induced periostitis. Weiser and Smrecker had similar effects by even a one per cent solution of this drug; Scheff recommended iodoform, Walkhoff chlorphenol, Schmidt thymol, Miller bichlorid of mercury with thymol, Kirchner thymol with iodoform—a combination which when subjected to electrolytic action liberates iodine. Blair's apparatus for generating iodine vapor is based on this. Sachs and Sternfeld, the use of this preparation with creoline as being the best remedy. Bethel used a 40 per cent solution of silver nitrate, Schreier sodium and potassium compound, Schreier caustic soda, Pierce, Kirk and Bauer sodium dioxid, Callahan 50 per cent solution of sulphuric acid, Bönnecker modified this by adding sodium dioxid; Arkövy used muriatic acid, Hess nitrohydrochloric acid, Hoffendahl, Miller, Zierler, Boedecker and Brenner



an electric current of three milliampères acting for ten minutes in a solution of dioxid introduced into the canal. Grayson says that nitrohydrochloric acid is better than sulphuric acid because it does not attack steel and so does not demand platinum iridium points. Gellé states that neutral hydrogen dioxid is readily decomposed. Dentists were thus forced to turn to the so-called organic peroxids, or, as they should be classed, the anhydrides of acids, such as magnesium, zinc or calcium peroxids. Firth says that a 50 per cent solution sodium dioxid is the best preparation to clean canals thoroughly, owing to the formation of soap with the fatty degenerations of the pulp; this soap is easily removed by repeated warm water washings and is useful for excavating sensitive dentine.

If pathologic conditions of the pulps are studied it will be seen that fatty degenerations are less common than is usually supposed to be the case, and here is a cause of failure to remove many pulps. Bennette has shown that formaldehyde is of very slight diffusibility, as it is a great albumin coagulant. Putrefaction of proteids yield putrescin, cadaverin and neuridin, and both the products of putrescence and germ life must be destroyed before a cure can be effected, and this is a second source of error in successful root filling. Harlan advised the use of monochloroacetic acid and wisely says: "Very few drugs will reduce two gases, one to a solid and the other to a liquid. Some poisons are so elusive and escape so freely that it is impossible that a single or a double prescription will hit them all." Lepkowski, in 1895, introduced formaldehyd, but this he soon abandoned, as even by Trillat's method, where so small a quantity as 1 in 20,000 can be detected, even that amount could not be noted in roots. Some error has existed in the directions in using the drug as advised by Lepkowski to the late Dr. Szymkeiviez, who advised that the tooth be treated with 40 per cent formalin and then be filled at once.

Gysi was the first who made use of trikresol formalin, which is now adopted by Buckley as formalin kresol. The addition of trikresol is valueless, say some workers, as the formalin is the true active agent. In spite of its antiseptic properties, however, the suitability of this compound is limited, first by its instability; second, by its caustic and irritant action, which frequently causes violent inflammatory phenomena in the periapical region and worse in the periosteum. Prof. Dr. Med. Edgar Neumann<sup>1</sup> reports only two successes in forty-one cases, and Boennecker<sup>2</sup> shows the disadvantage of employing kresol preparations, for they are coagulants and diffuse even through cement fillings.

Neumann says that he strictly and faithfully followed the directions given by Buckley<sup>3</sup>. Extraction had to be performed in five cases; in three cases pericementitis supervened: many patients complained of pains. He

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<sup>1</sup>Wien. Vrtljahrs Fachblatt, 1911.

<sup>2</sup>Deutsche Zahnknd, XII.

<sup>3</sup>Dental Cosmos.

advises against its use, as it seems unreliable and unsafe<sup>4</sup> and suggests the use of Lepkowski's method (1895), of radicin 1, 2. Radicin<sup>5</sup> ( $\text{NaClO}_2$ ) and  $\text{Na}(\text{OH})$ , forming  $\text{HClO}$ , from which chlorin is liberated and unites with hydrogen, forming hydrochloric acid, as it has all the advantages of an antiseptic germicide, is non-irritant, dissolves organic matter, is not a solidifier nor a coagulant, penetrates and does not discolor but bleaches. In pulp decomposition with peridontitis, this preparation is rapid and favorable in action and is also a deodorizer. On opening teeth which had been treated with radicin two years, they were sterile through a long and carefully tested bacteriologic examination.

The value of radicin (solution of sodium hypochlorite in caustic soda) in over 5,000 cases is the dissolution of organic substances; it destroys micro-organisms except Koch's bacillus and dissolves the organic salts of the tooth, leaving unaltered the inorganic, spongy portion. It can also dissolve Harvard cement, Fletcher's artificial dentine, and even some gold amalgam. It acts effectively in a few minutes after being applied, where other remedies hitherto used have taken weeks. Soaps are formed from the pulp détrit, its salts and acids, the chlorine is evolved in a nascent state, sterilizes the chamber and nerve canals, readily penetrates the tooth substance, destroying bacteria, and because of its ability to unite with water in any proportion, does not irritate the periodontium or alveolar tissues. It also enlarges the lumen of the canals and allows reasonably quick root paste fillings, etc. Barbed brooches can be made clean and aseptic by dipping in radicin liquid for several minutes, rinsing in water and drying in alcohol; they are then fit for further use.

Can we by accurate treatment and filling of a root like Fig. 1-C or D, that has exostosis (hypercementosis), render that root without pain in the future and suitable for a crown, or for use as a pier to support a bridge, say for instance in roots like the ones shown in Fig. 2 and Fig. 7? Many dentists, I know, have unwittingly filled and used such roots and afterward found that the periodical pains have ceased, or, in more numerous cases, have increased in the tissues because the pain is of that neuralgic character that does not locate in the root.

After death of a pulp, chronic fibrosis set up by the absorption of minute quantities of septic material, induces or is followed by active growth of the remnants of epithelial masses amid hypoblastic and mesoplastic areas (Fig. 2 a-i). In studying the tissues of the tongue, gums and palate, such masses are often seen, due, I think, to sequelæ of surface invasion. M. Malassez first demonstrated the presence of the alveolar dental ligaments-peridontium, naming them peridental epithelial remnants. They originate in a prolongation of the enamel-forming organ of the tooth, which precedes and determines the formation and shape of the dentine of the root and what is called

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<sup>4</sup>G6nka, D. Andrez: Rep. Dent. Clin. Univ. Lemberg. Lemberg Med. Wehnschr., 1908. No. 38, Which Method of Treating Root Canals in Putrescent Teeth Is Best? Deutsch Chronik, 1908.

<sup>5</sup>J6sse, Ferd.: Ash's Vienna Quart., 1910, No. 1. Lepkowski New Method.

dentine, root of ligaments, "the epithelial sheath of Hertwig." On the formation of the dentine the surrounding mesoblastic cells invade and partly destroy the sheath, applying themselves to the surface of the dentine and forming the cementum and alveolar dental ligament. The undestroyed portions of the sheath remain as the peridental epithelial remnants. These are seen in the small growths attached to dead roots, called root tumors, cysts. In many of these growths they are the chief element and give the shape, being truly epithelial root tumors, attached to any part of the radical apex and of a size to form a connective tissue capsule; later they may show cyst formation. When sections are studied microscopically, there may be noted in some a cleft in the tissue, a result of the breaking down of the cells, and if this is studied carefully epithelium can be seen. In one of my specimens columnar ciliated epithelium was seen and in another the ordinary epithelium of root tumors<sup>6</sup>. Römer has lately called attention to this condition.

The occurrence, histologically and pathologically, of ciliated epithelium, perhaps containing a colloid substance resembling that of the thyroid in the human, is not definitely known. The late Prof. Chas. Stewart, curator of the Royal College of Surgeons' Museum, London, says: "Ciliated epithelium occurs in the mouth of amphibia over most of the buccal cavity and in tadpole on the skin; in ophidia, in pharynx around the choanæ and from that point backward on the gums." It is not present in the mouths of mammals, birds, cheloneans, lacertilia. Thus it may be a reversion to type or a freak of growth. An epithelial cyst is encountered in the gums which has an analogous history to dental cysts; it may be called a gingival cyst. Mr. J. G. Turner<sup>7</sup> has found three cases which would be considered examples of this variety.

One of the most important studies today should be a more complete research into the glands of Serres in the foetal jaw and their possible inclusion in the mucoperiosteum of the gums, forming the glands or epithelial ingrowths; and may by some be called the milk-tooth germ.

If these glands of Serres are irritated long enough they enlarge, break down, and form epithelial cysts. How far these cysts are concerned in the mucogingival secretions which erode the cervical margins of the teeth in deposition of black stains, and play an important part in the etiology and pathology of caries and so-called pyorrhea alveolaris, is a matter for future research. I have seen cases in which the constant absorption of septic infection from sinuses led to inflammation and growth of these glands of Serres. With the great increase in neoplasms of the oral cavity, we must remember their etiology for tumor productions in cause and effect, such as we find nowhere else in the body. We have the "rests"—peridental epithelial remnants—on the one side, the glands of Serres on the other; then a chronic irritant, mechanical, bacterial or chemical, and a final pathologic result, an epithelial new growth, dental or gingival. This new growth is



nearly always connected with dental caries and dead teeth of the second dentition, for the entire removal of temporary teeth and alveolar absorption is against it being often seen in the primary set. Whether there may be epithelial growth at the apices of the teeth is a subject for further report, but it is possible (Fig. 2). It must be remembered that embryonal cell development shows much variation in types of cells due to rapidity of growth, pressure, blood supply, etiology and age of the patient. If we recall the work of Anton Kozma<sup>8</sup> and Alfred Kay<sup>9</sup> we see in 1,000 cases of inflammatory diseases the following in the order of frequency:

Acute periodontitis, 5.2; alveolar affections, 8.3; acute pulpitis, 18.1; chronic periodontitis, 31.0; chronic pulpitis, 37.4; while the first lower molar is given as the greatest offender in inflammatory conditions. Witzel showed



Fig. 2. Specimens hardened and shrunken in formol alcohol. Photographed under water

conditions of dental organs having cysts, decayed teeth and gangrenous pulps in ninety-six cases, or 91.4 per cent. (Fig. 2.)

Many questions can be asked and various theories advanced why the first molar is the subject of so many troubles. Possibly its time of eruption and location have much to do with it, for it is evidently the direct nerve connection between the odontoblasts<sup>10</sup>, dentine and periodontium through the protoplasmic fibrils, supplied with vasomotor function<sup>11</sup>. Situated

<sup>8</sup>Kozma, Anton: Record of Dental Hospital of Budapest; investigations into the Statistics of Disease of the Tooth Pulp, Periosteum and Alveolus.

<sup>9</sup>Kay, Alfred: Ein Beitrag zur Statistik der Zahnkaries; inaug. diss. z. Doctor wurde, Kiel, 1886.

<sup>10</sup>Latham, V. A.: Literature of the Pulp. The Journal, July 13, 1901.

<sup>11</sup>Latham, V. A.: Résumé of Histology of the Pulp. The Journal, July 12, 1902.

histologically at the periphery of the pulp, their dentinal contact<sup>12,13</sup> and the gingival blood supply, they must be peculiarly susceptible to the slightest variations in blood pressure<sup>14</sup>. The positive evidence that odontoblasts form part of the sympathetic nervous system is therefore important.

A notable result in experimental work is the easier staining and injection of the pulps and teeth in the mandible compared to those in the maxillæ, and this may prove that absorption of bacterial and inflammatory products is more rapid for the lower molar teeth.

Long ago, before one dared to regard dentistry as an integral part of medicine, dentists endeavored to fix their attention not only on the teeth as such, but also on diseases of the surrounding parts proceeding from them. Thus, chronic alveolar conditions, especially abscess treatment, was one of the many bridges by which dental therapy sought to find entrance into the region of general medicine and surgery. The septic root canal, irritating the surroundings of the apical foramen, causes an acute or chronic alveolar abscess, communicating either through a fistula or in a so-called blind abscess without any fistulous opening. Some of these con-

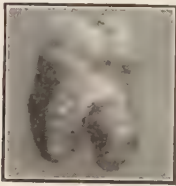


Fig. 3

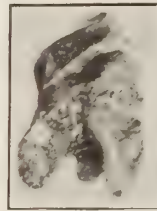


Fig. 4

Fig. 4. Gold cap not even placed correctly over the crown—calculus, abscesses and pyorrhea.

ditions are so gradual as to be unnoticed by the patient as regards pain or discomfort. Some cases show hyperplastic alterations in the root membrane and in the cementum, and can be regarded as a test of the power of these tissues to isolate or protect themselves against the penetration of the septic products by the formation of a limiting membrane. What happens? The apex of the root loses the periodontium, which connects with the nutritive organ the maxillary bone, becomes a dead part of the root and the tissue around acts toward it as to a foreign body. The alveolar bone marrow seeks, by granulation, to combat this necrotic root and the granulations of the limiting membrane seek the resorbing of the necrotic part. A similar condition is seen in pushing off bone sequestra. The smooth surface of the apex is now eroded by jagged osteoblasts, and often a granular membrane can be scraped off. Crystalline deposits are often present and so form a point of attraction for decomposition of septic matter. (Figs. I-e, 3, 4 and

<sup>12</sup>Rygge Johan Christiana. Innervation of the Tooth Pulp. The Dental Era, St. Louis, page 289, July, 1903.

<sup>13</sup>Walkhoff, Otto: Hypersensitive Dentine. 1899. Walkhoff: Normal Histology of the Human Teeth, including Microscopic Technique, 1901.

<sup>14</sup>Latham, V. A.: Pathology of the Pulp. The Journal, Sept. 22, 1906, page 920.

Latham, V. A.: Neoplasms of the Pulp. The Journal, Aug. 20, 1904.

7.) Tartar deposits with bacteria can go through a fistulous opening carried by the saliva (Partsch) and be a cause for Ranula.

Let us now exclude the primary cause—septic matter—and consider the secondary cause, namely, conditions in or about the root membrane, and remember that irritations of a foreign body—gutta percha points, nerve probes through the foramen, and chemical irritants, especially the arsenic, creosote and formol preparations (Fig. 1). It is a most reprehensible practice for anyone to put any of these drugs into a partially cleaned root and hermetically seal it in at the first sitting. If only the rule of the Mikado could apply to the operator—and not to the patient—of “let the punishment fit the crime,” much less formol, kresol, etc., would be pumped in and out of roots. If the bacteria and putrefactive products are not driven through, then the volatile gas is and the suffering of the patient is intense. Granted,

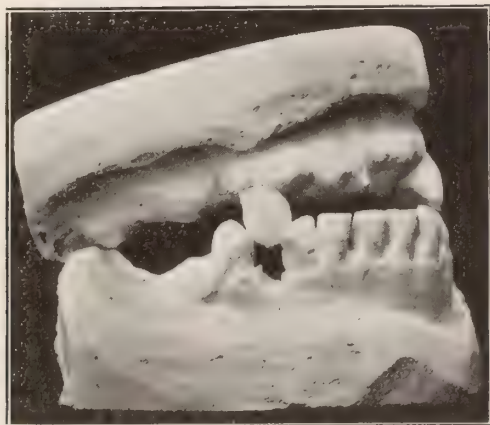


Fig. 5

Fig. 5. Mal-occlusion, severe paroxysms of neuralgia-pyorrhea.

pus is not always the result, there may still be chronic inflammation and closure of the apical foramen. When also formation of calcific deposits result in the canal or cement hypertrophy on or around the apex, antiseptic methods do not penetrate to the real cause—perhaps masses of bacteria of a low degree of power lying around the apex.

The lime solving action of sulphuric acid is not sufficient in all cases to open an entirely closed foramen, and root canal reamers in the hands of some dentists are dangerous instruments, causing lateral or apical perforation or even fracture of the root.

In the calcified, fibroid pulps even pepsin papoid digestants, followed by the drugs before mentioned, are not successful, and we must resort to an operation first introduced by Dr. M. L. Rhein, in 1890, and known as amputation of the roots. This operation was hardly noticed until Prof. C. Partsch<sup>15</sup>, of the Royal University Breslau, supported this method, not

<sup>15</sup>Partsch, C., and Kunert: Fourth report of Polyclinic for Diseases of the Mouth and Teeth, Dental Institute Breslau, *Deutsch Monat. Zahnheilkunde*, XII, Jahrgang.



knowing that Dr. Rhein had previously recorded<sup>16</sup> it. Arthur Masur of Breslau modifies the operation by not amputating, but smoothing and clearing, the root of the pathologic alterations and so preserving it as far as possible<sup>17</sup>. Weiser of Vienna<sup>18</sup> directs attention to the danger of injury to the inferior dental nerves, etc.

Between the bur and 50 per cent of sulphuric acid all the rough surfaces and granulomata often seen about the roots are removed, and seldom is it necessary to amputate the root of the tooth. Mild local anesthesia is advisable in the region of the center of the root under the gun. Very little pain is felt, and then only on entering the abscess cavity; this pain ceases, however, as soon as the acid solution is applied. The greatest difficulty lies in a true diagnosis of the condition of the tooth, whether dead or alive, for a partially dead pulp will respond to heat and cold even more actively than a tooth in a normal condition. Again, there may be no pain on applying

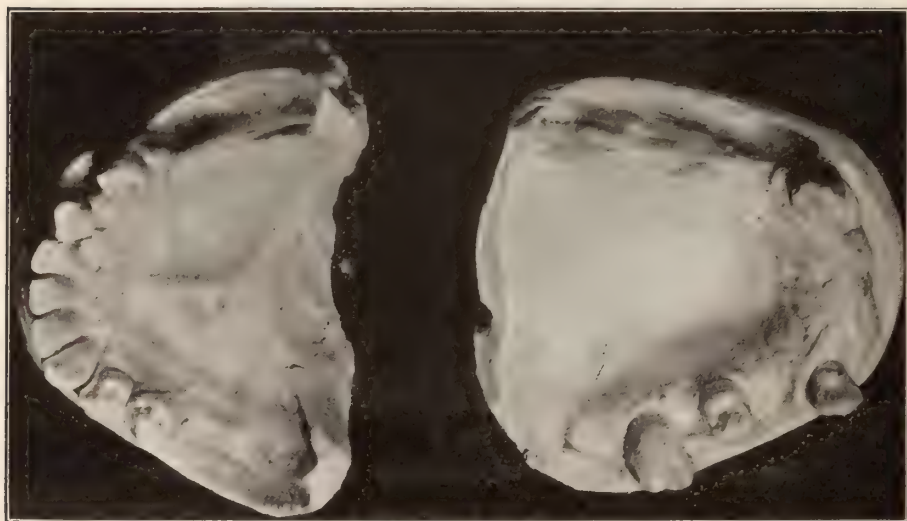


Fig. 5a

cold, but intense pain on the application of heat or sweets, and this is a very important point in a discriminating diagnosis. Some diathesis, as the rheumatic or arthritic, may give a chain of exaggerated symptoms similar to a septic pulpitis or periodontitis even in dead and carefully filled teeth. The internal use of Atophan, devised by Prof. Nicolaier, helps these uric cases very much, and in Riggs disease. Again, an exostosed and carefully prepared root may radiate pain so that an unoffending tooth has been condemned. Chronic inflammatory granuloma will cause many errors in diag-

16Dr. T. L. Gilmer tells me that Dr. Homer Judd, about 1866, first proposed this and taught it when he was a student in St. Louis, 1870-1871.

17Cor. Bl. f Zahnärzte, May, 1903.

18Weiser: Studien Beit. z Technik der Mund Chir., Vienna. Cor. Blatt f Zahnärzte, 1902.

nosis, even an X-ray shows a suspicious pus pocket where free incisions under gas anesthesia reveal nothing. Valuable information might be recorded if some radiographer would study and record the appearances found in the films, as proved later by the clinical symptoms and treatment, for many light areas have been called abscesses, and resorption areas incorrectly. (Fig 6.)

In conclusion, dentists must learn to diagnose root and periodental conditions before crowning and bridging; must be careful of mechanical work in fitting and banding; must watch carefully for hypersensitive periodental



Fig. 6

Fig. 6. No evidence by X-ray, but extraction revealed Cystic Granuloma the cause of an extreme neuritis and facial spasm.

membrane and for idiosyncrasies in patients of the arthritic type; must avoid violent irritants of any nature and *must not seal too tightly with volatile compounds at the earliest treatments*. Cleansing and filling roots must be thoroughly done; bridging should be avoided unless the patient's occlusion and the root conditions are understood thoroughly. Five or ten teeth must not be expected to stand firm if fitted on two or four weakened and inadequate piers. (See Figs. 5, 5a and 7.) Apical ends of roots should

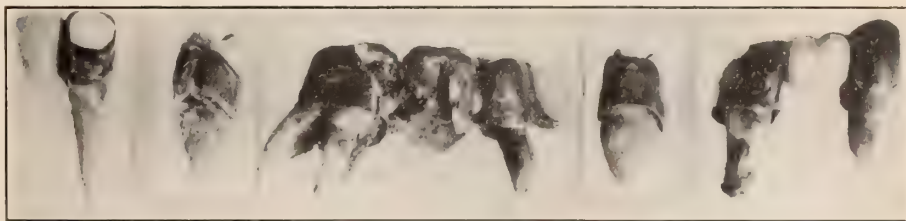


Fig. 7

Fig. 7. Ill-fitting bridges and crowns, which caused acute septicaemia, with loss of the exterior alveolar plate, and almost ended fatally for the patient.

not be amputated if milder measures will avail, and it should be borne in mind that the employment of high frequency currents has been of use in the treatment of scores of mucous neoplasms, cysts, abscesses and alveolo-dental pyorrhea (F. Morel).

In regulating cases for young people, the dentist should be on watch for periodental irritations, oral sepsis, infections of the lymphatics, tonsils, nasal and accessory sinuses through the entrance of bacteria by trauma, irritations, ulcerations. Rapid *resorption* of bone should be avoided as

well as an *excessive* deposition of calcific material. The hyperplasia and hypertrophy of the buccal membranes later may bring about degenerative changes, and in many cases a series of pulpless teeth, by the too ready regulation of dentists not well trained in a broad scientific as well as mechanical manner. Unfortunately, few dentists follow their patients to a late date and note any damage which may have arisen from his regulation of the teeth themselves or from the use of silicate cements. Many surgeons have set broken jaws well from the anatomic standpoint of bony union, but in a lamentable manner from the viewpoint of the stomatologist who looks for perfect occlusion as well as for bony union without deformity. The dental pathologist must aid the stomatologist.

### FILLING OF DECIDUOUS TEETH.\*

By G. H. Westhoff, D.D.S., St. Louis, Mo.

**I**N SPEAKING to an audience of dentists, I believe it unnecessary to spend time in defense of preserving the temporary teeth. I take it for granted that all agree as to the necessity of preserving these teeth for the comfort and well being of the little ones that come into our hands.

The deciduous teeth are usually a much neglected class of organs and a thoroughly cared-for condition is not easily obtained, because we generally do not get these little patients at the proper time.

Children are often brought in fear and trembling, and we ought to exercise all our tact and skill to avoid giving those dreadful, first impressions that are life long, that keep many patients from our office. When the little ones present themselves, our first duty is to alleviate the suffering and gain their confidence by some simple remedy at the first sitting, after which they will readily return and we are then enabled to do most operations.

To secure the best results in the management of children we must be willing to sacrifice time and energy, and to exercise unlimited patience. The operations should be as short as possible.

The two groups of teeth that should receive especial attention are the cuspids and molars, for these remain in the mouth until after the approximating permanent teeth are in position.

In superficial cavities many times all that is necessary is to thoroughly polish, and then stain with silver nitrate. Should the cavity need filling, silver amalgam is generally indicated in posterior teeth. In deep seated cavities we should use a considerable layer of cement between pulp and filling. Great care should be used not to inflict severe pain. It is far better to leave a little softened decay in the bottom of the cavity, and stain with silver nitrate. In deep cavities where little retention can be had, and where dryness is impossible, copper amalgam is supreme.

Oxy-phosphate of zinc cement can be used with good results in some cavities and is especially indicated in the anterior teeth, and should always be protected with a coat of paraffin while setting.

\*Read before the St. Louis Society of Dental Science, 1912.



Gold fillings can occasionally be used in anterior teeth in cervical cavities, but this depends entirely on the child, and the extent of the absorption of the root.

Never fill two approximating cavities at the same sitting. Fillings should be well contoured, thereby preserving the arch and rendering thorough mastication possible, and no overhanging fillings should be permitted.

Where near exposure of the pulp forbids the use of amalgam, oxy-phosphate of copper cement can be used. It is a mistake to try to do the most thorough work for children. It is better to repeat a mild operation and retain their confidence by avoiding the infliction of pain unduly.

In cases where the teeth are decayed in a number of places or show signs of decay it is well to make an application of silver nitrate where the enamel is decalcified or where decay is just beginning. This will retard the decay or may even stop it. But when the decay has progressed far enough to permit food particles to lodge in the cavity, the application of silver nitrate will be insufficient. Time and later trouble will be prevented by filling such cavities. However, if there are several cavities to be filled, it is a good thing to make an application of nitrate silver to all the cavities at each sitting as the work proceeds. These applications should be made several days before any attempt is made to prepare the cavities for the filling. The soft dentine may then be removed from one or two of the cavities and an application of

Cocain Hydrochlorate . . . . .	Grs.	V
Menthol . . . . .	"	XX
Thymol . . . . .	"	XL
Phenol . . . . .	"	XL
5111		

or of ugenol and aristol may be made. A small pellet of cotton may be dipped into the ugenol and squeezed with a napkin and then dipped into the aristol. Either of these applications may be left in the tooth several days before the final preparation of the cavity for the filling.

When the pulp has become exposed in a child's tooth, it is usually allowed by the parent to remain untreated for a sufficient length of time to become infected so that it would be devitalized within a short time if not treated at all. This is probably true of nine-tenths of the cases. The other one-tenth will require arsenic. Before, however, the arsenic is applied a treatment of

Cocain Hydrochlorate . . . . .	Grs.	V
Menthol . . . . .	"	XX
Thymol . . . . .	"	XL
Phenol . . . . .	"	XL
5111		

should always be applied to relieve the pain and should remain in the tooth twenty-four hours. The arsenic is then applied, but should never be applied

in older children's teeth where a great amount of the root has been absorbed. In these cases, equal parts of

Menthol . . . . .	Grs. XX
Thymol . . . . .	" XL
Phenol . . . . .	" XL
5111	

will be sufficient, as this application is also sufficient in the other nine-tenths of cases of exposed pulps, spoken of previously.

Arsenic may be applied at the second sitting in cases where it is necessary under a pellet of cotton saturated in chlora-percha, or better, under temporary stopping or cement, as the case may require. The utmost care must be taken to protect the gums from these applications. There are cases where one of these coverings is better than either of the other two. One thing is certain: we must not apply pressure to the arsenic if it is over an exposed pulp. The arsenic should not remain longer than twenty-four hours in the temporary teeth, but in permanent teeth forty-eight hours, at which time the pulp may be removed in permanent teeth, or if too sensitive in temporary teeth, an application of

Menthol . . . . .	Grs. XX
Thymol . . . . .	" XL
Phenol . . . . .	" XL
5111	

may be applied and allowed to remain forty-eight hours. The pulp should then be removed and a dressing of phenol applied into the root canals to remain forty-eight hours. Then the canals should be filled with chlora-percha and gutta-percha canal points. If this procedure is carefully and perfectly followed, there will be no further trouble from the canals of the tooth. When the tooth is lost it will be found that the roots have been resorbed, leaving the gutta-percha point standing out beyond the end of the root for a considerable distance. If there is any difficulty in keeping these teeth dry while treating them, I do not hesitate to apply the rubber dam, and, in fact, it is usually much easier than to treat them without it.

In treating an abscess resulting from decay in a temporary tooth, the decay should be removed as far as possible, and also the *debris* should be removed from the pulp chamber and canals. An application of Buckley's forma-creasol should be made into the pulp chamber of the tooth. At the second sitting, if the abscess is without a fistula, a so-called blind abscess, an application of phenol may be made into the canals, or if an abscess with a fistula, an application of forma-creasol may be made. When the canals are ready for the filling they should be filled with chlora-percha and gutta-percha points.

**THE TREATMENT OF CHILDREN'S TEETH.\***

By Edward Everett Haverstick, D.D.S., St. Louis, Mo.

The treatment of children's teeth will, no doubt, vary according to the individual who treats them. It will also vary somewhat with different children. It is a lamentable fact that we have not decided, as a court decides, on the best methods and remedies for treating teeth and adopted these methods and remedies universally.

If we could have the children under our care entirely, as we have our own children, from the time that the first little tooth appears until the temporary teeth are lost, then this paper could be written in a few words. That is to say, see the children often, keep their teeth clean and fill any cavities that may appear while they are very small. We have many patients of this kind and what a pleasure they are to us to see the beautiful white teeth of these healthy little boys and girls and know that they have never suffered the pain of toothache. Also, to know that they have been able through the first years of their lives, at least, to masticate their food with a perfect dental machine; and that they will have no irregularities resulting from the too early loss of their temporary teeth.

Unfortunately, this is not always the situation. On the contrary, we are called upon not only to clean children's teeth when they are covered with stain and food particles, but to treat deep, sensitive cavities and even exposed pulps and abscesses. All of these conditions, in almost all cases, can be certainly and safely treated and permanently filled. Does not that statement sound gratifying? No doubt some dentists will question it, but it is true nevertheless.

The treatment of children's teeth is a difficult task, and I am sure that no one will question that statement. The ability to treat their teeth successfully depends on our skill to control the children. They must be amused and be mastered at the same time. I tell them that Santa Claus looks out of the ventilation holes in the top of a wall across the street; that papa will be so pleased with such a brave child; that he is a real soldier to be so brave; that two little horses, a white one and a black one, race up and down the inside of the flexible cable and pull the engine, and that sometimes one reaches the end first and sometimes the other, and have the children guess which. I ask them of their dolls, their toys, their playmates. I talk a great deal to children and say very little to grown people.

If none of these various methods appeal to the children, which is very seldom, then my assistant holds them for the first treatment, which is short. The mother *always* stays in the waiting room and the door is closed. Above everything, you should accomplish something at the first sitting. Make the child think that you have done all you expected to do whether you did or

\*Read before the St. Louis Society of Dental Science, 1912.



not. Always quit what you are doing, if you see you must quit, before he makes you, so that you are still master.

But someone says, what has this to do with the treatment of children's teeth? Why, everything. It is the secret of success with children.

In cleaning children's teeth it will be found an advantage to make an application of the compound tincture of iodine to the teeth, especially if there are any stains or soft deposits on them. The compound tincture of iodine colors the stains and deposits so that they may be easily seen. It also forms chemical compounds with them so that the teeth may be cleaned easily.

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## THE INFLUENCE OF DISEASE, PRENATAL AND POSTNATAL, UPON THE DEVELOPMENT AND CHARACTER OF THE HUMAN TEETH.\*

By Frank Acker, D. D. S., Cleveland, Ohio.

SOMEWHAT abbreviating the beautiful introduction in Ziegler's General Pathology in regard to health and disease in man, we may say that with the fertilization of the ovum begins a series of changes, cell proliferation resulting in the formation of an embryo, which at a certain time is expelled from the maternal organism, continues to grow, reaches a physical maturity, remains approximately at a fixed weight for a prescribed time and then perishes. So long as the human organism remains in a condition common within certain limits to all humanity, we call it a state of health.

The temperature, heart beats, respiration, ingestion of food, excretion, and action of the nervous system, all differ very little in different individuals in health. "Disease," he says, "is nothing else than a life, the manifestations of which partly deviate from the normal." Medicine now recognizes that (the function of the tissue being dependent upon the organization of the tissue) a change in function implies also an alteration in the organization of that tissue so that now in considering disease, we note not only altered function, but anatomical changes accompanying the same. Though our knowledge does not enable us to correlate definitely in all cases changes in function and tissues, the progress in this direction is encouraging. The essay of the evening will confine itself to a consideration of the influences of a few of the more common diseases, prenatal and postnatal, upon the teeth proper, and only incidentally upon the periodontal membrane and surrounding bone and parts adjacent to the crowns when erupted. It may simplify our study to take it up under two heads: the influence on the teeth in the process of formation, and secondly, upon teeth fully formed or erupted in comparatively normal situation. Briefly, in the embryo beginning development of the teeth may be noted about the

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\*Read before the Cleveland Dental Society, 1912.

14th day in a derivative of the ectoderm, the so-called epithelial band, the enamel organ dipping down into the mesoderm, which supplies the connective tissue elements. We have not time to go into this wonderful process of budding from the epithelial band and the invagination by the connective tissues to the formation of the temporary and permanent sets, only this much: Calcification beginning about the fifth fetal month, proceeds so that at birth the crowns of the temporary incisors and cuspids are nearly completed and the crowns of the temporary molars about two-thirds completed and the cusps of the first permanent molars begun. Disease then in the foetus or in the pregnant mother by a common blood supply could affect only the temporary teeth and the cusps of the first permanent molars.

How disease is inherited is not yet a settled question. Whether the disease exists in the ovum or enters on fertilization, whether the infection is intrauterine or placental, are questions undergoing further research. It is contended that syphilis may be inherited through the sperm of the father, because there are cases on record of syphilitic children born to a mother that was immune or at least exhibited none of the symptoms herself.

What diseases are inherited? The list is gradually decreasing and consists largely of diseases little understood, such as haemophilia, color blindness, insanity, epilepsy, hysteria, tumors, birthmarks, freckles, gout, corpulence, and a few infectious diseases like syphilis, smallpox, chickenpox, intermittent and recurrent fevers. Almost all writers admit that a predisposition to certain diseases may be inherited. If prenatal disease only affects the temporary teeth and cusps of the first molars, the effects of syphilis on the permanent teeth must be considered as pathological processes really postnatal, because at the time of birth the calcification with the exception of the first permanent molars, has not yet begun. Besides such a child has the ordinary manifestation of syphilis, namely, skin eruptions and inflammatory changes of the mucous membrane of the mouth, etc., during the first year. There is a theory pretty well established that certain diseases select tissues of like origin, no matter where distributed in the organism, for their attack. The enamel organ being of the same embryologic origin as the skin and mucous membrane, would according to the theory, be affected. Again, the continuous out-croppings of the various inflammatory lesions in syphilis affect the glandular secretion of the mouth so that acid erosions may add another destructive element to imperfectly formed enamel. And where this disease is controlled by mercury or iodides, these drugs cause inflammatory changes in the mucous membrane and peridental membranes also. It must be borne in mind the facial bones of the child are constantly changing, being reabsorbed and enlarged to meet the needs of the growing child, and the effects of syphilis are manifest in deficient bone development. Thus syphilitic children have been born with the crowns of the temporary teeth erupted, though naturally

at that stage the roots are not yet formed. The normal layer of bone over the teeth had not yet been deposited. Defective development of the nasal process and superior maxillary bones is likewise common in inherited syphilis. Later in life inflammatory conditions due to the re-awakening of latent syphilis may cause destruction of pericemental tissues and lead to the loss of teeth. Some other symptoms such as erosions of nasal or palatal bones and ulcers of the tongue, gummata (enlargements of the maxillary bones) are possible; yet under proper treatment may never arise. But the dental lesion known as Hutchinson's teeth, the notched upper incisors with the contracted cutting edge narrower than the cervical diameters, is rarely missing. Later investigators have claimed that these teeth are not pathognomonic, that other diseases may cause similar defects by interference with nutrition of the tooth-forming organ. After years of debate, Hutchinson's teeth in conjunction with catarrh of the middle ear and parenchymatous keratitis have been called the infallible triad, denoting inherited syphilis.

Inherited smallpox and chickenpox are now rare because of greater care in controlling epidemics and nothing could be found as to the effects on teeth. These diseases involving cutaneous structure if the aforementioned embryologic theory be correct, may similarly affect the enamel forming organ. Under the writings on hemophilia and color blindness, nothing was found showing tooth symptoms. Insanity, epilepsy, and hysteria generally conceded as hereditary, have not yet clearly defined pathological tissue and are usually classed as functional diseases. Eclampsia, a form of epilepsy, consisting of a single acute spasm, is cited by Black as having been the probable cause of one case of atrophy that came under his notice. Epilepsy, in about one-third of the cases, according to Dana, manifests itself between the tenth and fifteenth years, and in only one-sixth of cases as early as the fifth year. Such being the case no effect could be noted except on the second and third molar crowns in the majority of epileptics. In both epilepsy and hysteria, however, mechanical force in the attacks may result in enamel cleavages or abrasions. Lack of care in insanity predisposes to caries, also biting the nails to fracture in enamel. Tumors may produce a cachexia which may lead to rapid inroads of caries due to lack of resistance or viscous mouth secretions.

Gout manifests itself by painful inflammations thought to be due to an excess of urates in the fluids of the body. These urates may cause sclerosis; that is the development abnormally of connective tissue cells at the expense of the other cells of the part. In the teeth these irritants may result in formation of secondary dentin without signs of abrasion, nodules in the pulp, pericemental sclerosis and abscess and deposits in which urates are found. Urates have however been demonstrated by Black to be present in most calcic deposits about the teeth.

Much has been written as to the relation of gout and tooth disturbances. One theory of the etiology of erosion makes gout or rheumatic diathesis the primary cause. According to Thompson in the American Text, teeth of



gouty diathesis are usually large, slightly irregular in position and of good enamel structure, but as age advances gingival and pericemental disturbances arise resulting often in rotation of the teeth and abrasion of the occluding surface is noted. Rickets, a disease occurring between the first and third years, characterized by deficient deposits of calcium salts (leading to deformed long bones and curvature of the spine, open fontanelles and enlarged cranium) has for one of its symptoms delayed dentition.

Scorbutus (not common any more), a disease due to lack of variety in food, lack of fresh vegetables for instance, is said to result in loss of teeth through ulcerative stomatitis.

Scrofula, a disease characterized by enlarged glands (which Osler thinks tubercular in origin), has been said by some to cause muddy white teeth, that is, lacking in translucency. Tuberculosis of the oral tissues is rare, but when it does occur is usually fatal. It affects the teeth secondarily through necrosis of the bones and sloughing of the alveolar process. From personal observation of three families with tubercular tendencies that have been under my care, the teeth are exceptionally good in structure. In the above list of diseases where inheritance is an important factor, the effects upon the teeth are of such character that it must be considered of postnatal action rather than prenatal. In certain forms of diabetes prolific deposits of thrush are noted—in typhoid fever greatly increased deposits of tartar occur unless special attention is given to keeping the mouth clean. This may be due to the lack of mechanical cleansing by mastication as the food is restricted largely to a liquid diet. Thompson has noted defects in teeth as being inherited without connecting them with any particular disease, and Magitot laid stress on in-harmony in crossing such as the Cimbric invasion crossing with the Celt—the poor teeth of the Teuton affecting the good teeth of the Celt in the offspring.

Realizing that our studies through disease and symptoms and sequelae have borne barren results as to effects on teeth let us consider now for a short time the defects known to all of us and the nutritional theory.

The teeth like the nails and hair seem to lack power of perfect repair and interference with their development leaves a permanent mark. Interference with the nourishment of a tooth during a stage of its development results with markings such as lines, grooves and pits which Dr. Black describes under the head of Atrophy, by some called Hypoplasia.

Dr. Black thinks these markings follow the lines of Retzius, i. e., the incremental lines of enamel deposit. Enamel is deposited apparently in waves, layer upon layer, the later ones overlapping a little each time, giving rise to the visual phenomena called lines of Retzius. These grooves or pits therefore rarely penetrate to the dentin. (Black says he has not found one.) It must be remembered however that the nutritional disturbances affect the dentin also, but because of the different histological structure the repair is more perfect in the dentin. However, microscopic sections show definitely the interruption in the dentin formation. To the unaided eye such teeth show a general contraction, shortening, and narrowing of anteriors; in the

first permanent molars the cusps are drawn closer together and badly pitted and malformed. Though these markings seem to be more pronounced on the labial surfaces of incisors and cuspids, a closer observation will usually show that they encircle the tooth.

Other defects such as white spots and white enamel are thought to be due to nutritional disturbances, a sort of selective atrophy of the cement substances between the enamel rods. Pits accompanying lines and grooves or pits in otherwise normal teeth are due to failure in formation of enamel rods at a given point as though the disturbing influences did not affect the whole enamel-forming organ, but just a confined area. Notwithstanding the arduous study of these obscure problems in a medium so difficult to work with the time has not yet been reached where the etiology can be definitely fixed. The theory that the exanthematous diseases affect the developing teeth because they are of like embryonic origin as the dermoid structures does not explain how so large a proportion of children though subject to the ravages of skin eruptions show no signs of faulty teeth. Still the fact remains that in almost all cases where investigators have noted conditions of atrophy there is a history of some disease more or less severe in the child's life which would correspond to the time that particular crown was being formed. There are published several tables of periods of calcification and not much difference exists between Peiree's and Black's. There are probably data being collected in public clinics or there ought to be, where records are kept of the positions of the atrophy markings on the crowns, the history of a previous disease, if any occurred, and its relation in point of time with the accepted table of calcification. From a large number of such records there could be made safe deductions having more force than the generally accepted statement of individuals based on comparatively few examples. Dr. Black notes a case following a severe burn, so that any bodily ill for a time affecting the nutrition may leave its scar on the forming teeth. Besides the esthetic defects atrophied teeth on account of the grooves and pits are predisposed to caries. One theory ascribes erosion also to a nutritional developmental cause that has left the tooth structure in a weakened condition, and though erupting with apparently perfect outlines the action of the fluids both chemical and mechanical and other abrasive forces soon cause loss of tooth structure. Preiswerk evolves the theory of solvent action by an enzyme called trypsin found in the mouth, that acts in alkaline media dissolving the albuminoid element in tooth structure, which he calls dentoidin, leaving the mineral elements to be easily washed away. This may be a reason for erosions in mouths rather free from caries since caries would tend to acid reaction and thus retard trypsin action. But he does not connect these trypsins with any definite disease.

It is not the object of this paper to describe in detail the many and varied forms of atrophy or hypoplasia, erosions and malformations, but to try to trace if possible, a definite connection between disease and tooth

structure. With the exception of syphilis, the data are vague and most of the writings are theoretical based upon good logic it is true, but not yet carried out by clear scientific records such as will admit of no dispute.

## DISCUSSION

VARNEY E. BARNES: The subject our essayist has presented is along a line of thought that we as dentists should be intensely interested in. The paper bears evidence of considerable search of our literature and brings to us the condensed conclusions of our authorities. These conclusions are by no means definite or final and there remains the necessity of some concerted effort to collect data and study them scientifically. I take it that the paper read tonight is intended to stimulate this research rather than to present anything new, and a few earnest observers can add much to our knowledge on this subject. The teeth, so far as is known, are the only structures which do not change their form, therefore we have in the teeth the best of evidence, in cases of malformation, of a prior disease and changed function which has been mentioned by the essayist.

The paper states: "Disease in the foetus or in the pregnant mother by a common blood supply could affect only the temporary teeth and cusps of the first permanent molars." With this statement I cannot wholly agree. Disease, under the conditions, may affect other than the teeth mentioned, but it will affect them most noticeably. Previously it had been stated that in disease we note altered function and a resultant anatomical change; therefore, I contend that diseased conditions of the pregnant mother may affect the teeth mentioned and also other teeth subsequently formed. Please observe that I say may affect, although I believe it almost always does produce some abnormal effect, which may or may not be noticeable with our present observation and knowledge. For instance, the four chief temperamental forms of teeth and dental arches are now considered by our recognized authorities as normalities, whereas a strict interpretation and definition of the temperaments indicates that a particular temperament is a preponderance of one over the others and is consequently not strictly normal, therefore indicating anatomical and functional changes. The proper or ideal balancing of the temperaments would mean a normal-ideal harmonious being—rare, indeed, if there ever is such among mortals. I am much inclined to the belief that pre-natal conditions of the mother have much to do with the health of the child and consequently with his teeth in both form development and structure. In an article read before the recent National meeting (January *Cosmos*, 1912), I made this statement: "The difficult teething of the infant results from a defective development which is generally associated with artificial feeding. Artificial feeding not only implies imperfect feeding and assimilation, but also is indicative of the necessity for that artificial feeding, which means the failure of the natural food. The failure of the mother's milk to properly nourish the infant indicates that the pre-natal conditions were not correct or normal, and that neither the food nor the child were normal or suited to one another; therefore, pre-natal and post-natal developments must be more or less deficient."

Heredity, disease or malnutrition—call it what you will—may produce inharmonious development of maxillary bones and teeth. If the teeth are large and the bone small, there will be impactive pressures which may alter the tooth forms through undue pressure. The curvature of roots is a particular instance of this (illustration of bayonet-shaped root, which was part of impaction affecting eyes and mentality) curvature of crowns also. Irregularity of tooth positions can be traced to disease, and this irregularity leads to gum diseases and to the formation of pulp nodules through faulty occlusion.

In addition to this I have several cases in mind in which the ill health of the mother corresponded with markings and deficiencies on teeth which were in process of formation at the corresponding times. Still other cases have shown infants with temporary teeth so defective that they seem to melt away in a few months; the history of such cases reveals pre-natal illness of the mother. In these latter cases the permanent teeth



do not necessarily decay so readily, but they are evidently below par in structure or resistance, and their forms seem less distinctive.

In considering disease, I do not feel competent to discuss the so-called inherited diseases, but as for diseases in general I feel certain that we must recognize that we *may* have a disease in so slight a form as not to recognize it by any of the usual symptoms. These slight diseases, often evident only as light fevers, high temperatures of short duration, etc., may produce marked effects upon some organisms and apparently none on others. Again, a severe disease in infancy may severely mark the temporary teeth in some individuals and apparently show no effects in others. This is contrary to the remarks of the essayist, but we know that the same medicament does not produce the same results for different individuals, and likewise diseases affect individuals quite differently with enough of similar effect to show probabilities and tendencies. In regard to syphilis, I believe we should attribute the marked changes in tooth form to the virulence of the disease—less virulent diseases leaving lesser effects.

In studying the calcifications as noted by Peirce, I note what appears to be an error, and that is in the case of the lower cuspid, which is generally supposed to start calcification at about three years or at the same time as the upper cuspid. The lower cuspid erupts generally at least two years before the upper, and therefore its calcification should be considerably earlier than the upper.

The essayist mentions the need of collecting data through public clinics, but here I will again differ. The class of patients at the public clinics is such as to prevent the collection of the definite details which are absolutely essential to successful results. These public patients are irresponsible, ignorant, and the cases cannot be followed up consecutively. A better result should be obtained by several observers agreeing upon a certain method of observation, using like charts and then noting the cases in private practice among intelligent, responsible people.

As mentioned, Dr. Black has done excellent work, but we need to dig still deeper. We must realize that we are concerned professionally with the health of the community and must take our stand with other scientific bodies in the uplift work. To take that stand we must work and think still harder than heretofore. Our thanks are due the essayist and the program committee for this paper, which has entailed so much reading and thought.

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## A CASE OF EXTENSIVE NECROSIS\*

By F. L. Gravis, D.D.S., Martinsville, Ind.

This clinic was a case of necrosis of the entire lower maxilla of a boy six years old, two years having elapsed since the beginning of the trouble. Necrosis was caused from an acute alveolar abscess in lower left first temporary molar. All of the main body of the bone on both sides, including the condyle on the left side, was lost, with it the partially formed teeth with the exception of lower right first permanent molar and four incisors. A new bone formation has taken place, giving him a good maxilla. He was not disfigured in any other way than losing his permanent lowers; upper teeth are good. Treatment consisted of the use of peroxide of hydrogen with alkaline mouth washes, also a good systemic tonic.

\*Clinic at Indiana State Dental Society.

**FUSED INLAYS, USING PLATINATED GOLD\***

**Suggested by Weston A. Price, Cleveland, O., Demonstrated by  
T. J. Hill, Cleveland, O.,**

By the following process of platinizing shredded pure gold, its melting point may be raised so that pure gold may be melted into a mass of it without melting or changing its form.

Pour over any form of pure gold fibre, wool, moss, pellets or foil (a shredded pure gold is preferable) a 5 to 10 per cent solution of platinum-chloride sufficient to dampen or wet all surfaces and pour or squeeze off the excess. The platinum chloride can be made by dissolving platinum in aquoregia (which is  $\frac{1}{4}$  hydro-chloric and  $\frac{3}{4}$  nitric acid mixed) and driving out the nitric acid by heat, redissolving in hydro-chloric acid and diluting with water. Next pour over it a solution of ammonium chlorid and flow it through the mass a time or two to precipitate the platinum-chloride as platinum ammonium chlorid, which forms a yellow precipitate over the surfaces of the gold. Take the water out of the mass by slowly heating or, preferably, by washing with alcohol. Then heat to a dull red, which changes the yellow platinum-ammonium chlorid on the surfaces of the gold to amorphous spongy pure platinum, which combines with the gold when heated to a red heat, forming a gold and platinum compound.

The advantages of a shredded gold over a foil or pellets is that the former will not curl and warp away from the margins by the gold flowing on its surfaces, which the foil and pellets, when used in this way, will go. The platinized, shredded gold draws the pure gold into its mass around all sides of each fibre, thus preventing the curling. The platinized gold is packed into the cavities in artificial stone models and bar gold fused into it. The advantages are that there is less error from shrinkage and that we have the flow that we have in pure gold fillings for finishing and more strength because of the added platinum, and all in half the time required for casting.

\*Given as a Clinic at Ohio State Dental Society.

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**CAST BASES FOR CROWNS.\***

**By Dr. E. H. Wicks, Detroit, Mich.**

Prepare the root by enlarging at least two of the canals to receive the post. Then take either a Steele or Goslee tooth, preferably the Steele, and grind to place. Adapt the backing (if a Steele), build up the space between, taking an impression of the root and of the crown with inlay wax, the posts in place, and carve it off. It is now ready to cast. The finished article is simple, the parts being cemented together

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\*Given as a Clinic at Michigan State Dental Society, 1912.

**METHODS USED IN THE TREATMENT OF CHILDREN'S TEETH\***

**By W. R. Alvord, D.D.S., Detroit, Mich.**

In regard to the covering of exposed pulps in deciduous teeth, I use the Buckley formulas and employ the thymolized calcine phosphate as a vehicle to convey whatever remedies I desire to employ in the treatment of deciduous teeth. In the capping of the pulp I use oil of cloves with the calcium phosphate. After washing with warm water the cavity as clean as I can and excavating what I can, attempting to get an exposure, I break the pulp quickly to get a hemorrhage. In that way I attempt to find that the pulp is in healthy condition. If the pulp is in a healthy condition so that it can be capped, I put over a thick coating of paste which is prepared, filling nearly half of the cavity and working it down with a little broach on which the end is bent in a little loop to make it more easy to handle. Then I put over that a previously mixed copper phosphate cement. The entire operation takes but a minute or two and can be done on the average child with cotton rolls to keep out the saliva, and the future of the tooth is usually good.

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\*Given as a Clinic at Michigan State Dental Society, 1912.

**ANCHORAGE OF CAST GOLD INLAYS.**

**By M. M. Brown, D.D.S., Macon, Ga.**

Frequently the use of a detached anchor pin of gold or iridio-platinum is very useful to assist in retaining an inlay. In anchoring to badly broken-down molars when the roots diverge, insert one or more pins in the usual way, then insert a gold or iridio-platinum pin in the diverging root canal, leaving same sufficiently long to project through wax pattern. Press wax to place, carve and then, holding pattern firmly with the fingers, grasp projecting pin with the pliers and remove, giving a slight turn to the pin. Oiling the pin previously renders it easier of removal. Insert graphite point of same diameter of anchor pin in hole in pattern, invest, cast inlay, remove graphite point and cement to place, and while cement is still soft insert anchor pin. When cement hardens grind pin flush with inlay.

This method is useful in any case where it is difficult to parallel pins used for retention and occasionally when only one pin is used.

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**THE USE OF THE CASTING METHOD IN EXTREME CASES.\***

**By Dr. W. J. Whiteman, Detroit, Mich.**

I am showing the building up of broken-down crowns and roots with castings, making it as accurate as possible by the use of the impression method and making amalgam models. The broken-down root is built up outside of the mouth, as follows:

First the root is prepared so that the pin can draw very easily. Modeling compound is shoved up into the root canal. The pin is heated and

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\*Given as a Clinic at Michigan State Dental Society, 1912.



shoved into the modeling compound, giving a correct impression of the root canal. A stick of modeling compound is then taken, the end heated and shoved into position over the end of the root, giving an accurate impression of the root and the root canal. An amalgam model is then made, which gives an accurate model of the root and root canal. An impression is taken of the teeth and the root, the amalgam model is placed onto the impression of the end of the root and the model poured. This gives a model of the root in the same relative position to the other teeth as in the mouth. A bite is taken. Assemble on the articulator. The work of making porcelain crown is done from the model entirely, using any style of crown which is best adapted for case.

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### **A METHOD OF REPLACING A BROKEN PARALLEL PIN FACING ON A BRIDGE WITHOUT REMOVING BRIDGE FROM THE MOUTH.\***

**By C. H. Woolgar, M.D., D.D.S., Clyde, Ohio.**

Select a Steele's facing that is correct in size and color. Increase width of slot in facing with thin carborundum disk, so facing can be slipped down over pins of broken facings. With a stone, smooth backing of broken facing to a flat, even surface. Enlarge head of pins of broken facing with coarse gold plugger and mallet. The facing should slip down over pins without much force. The incisal edge of facing should be protected by metal of the bridge. It may be necessary to grind incisal end of facing to attain this result. Remove facing, dry bridge and facing, mix cement thin and fill slot of facing and some cement on backing of the broken facing, slip the facing to place.

\*Given as a Clinic at Ohio State Dental Society, 1912.

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### **LOWER POSTERIOR BRIDGE WITH CONVERGING ABUTMENTS.\***

**By W. S. Walters, D.D.S., W. Lafayette, Ind.**

A bridge from the lower left second bicuspid, which is in normal position to the lower left third molar, which converges at an angle of 45 degrees toward the bicuspid abutment. Make your abutments, shell gold crowns, as in ordinary cases, the one on the third molar being made without regard to the articulation except on the disto-occlusal portion; the reason for this will appear later on. Now make an interlocking device as follows: Take two strips of 30g-22k plate gold one inch long by one-fourth inch wide, anneal and placing the two together, grasp them in the center with round-nosed pliers; bend both strips of gold around the pliers thus forming two cone-shaped tubes, one fitting perfectly within the other; stiffen the inner cone or tube with solder on the inside and the outer tube on the outside, so in subsequent work they will not be distorted. Now place your abutments in

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\*Given as a Clinic at Indiana State Dental Society, 1912.

place on model and wax the wings of the inner tube to the third molar shell crown so that the tube is parallel with the bicuspid abutment crown, solder same in place. Now slip the outer cone or tube in place on the inner one (which is soldered to the third molar abutment) and wax up the space for casting the first and second molars. The second molar will contain the outer cone or tube. Allow the wax to extend well back on the mesio-occlusal half of the third molar abutment. This makes a good, firm shoulder resting on the top of this posterior abutment, and, as in making this abutment, we only made it so the disto-occlusal articulated, and by extending your wax you thus gain a perfect articulation for the mesio-occlusal half. When bridge is completed you will first set the third molar abutment (which converges) and then set the anterior part of the bridge, filling this locking device (the cones or tubes) with cement same as you do the abutments. The dummy part of this bridge may be cast solid gold or with porcelain facings, at the option of the operator.

After using this method successfully for over two years, I feel safe in presenting it to you in this clinic.

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### DIATORIC OR OTHER TEETH IN BRIDGEWORK WITH LEAST DISPLAY OF GOLD.\*

By A. McAlpin, Bradford, Pa.

This clinic intends to show that a groove cut in the approximal surfaces of a porcelain crown into which gold may be burnished or swaged will give the tooth a retentive shell without the necessity of a rim on the buccal or exposed surface. The technique is as follows:

A porcelain crown is ground and fitted to the case on hand, with the sides at least parallel. Then a narrow vertical groove is cut with a thin disk in each approximal surface, say  $1/32$  inch deep. A piece of pure or 22k gold or other pliable metal, about 36 gauge, large enough to fold up on the lingual and approximal surfaces of the crown, is taken. The gingival surface of the tooth is placed on the gold, which is folded up on the crown and burnished to it and into the approximal grooves aforementioned. The folds at the corners may be pinched together with a pair of pliers and turned over on the lingual or approximal surfaces.

The crown and enveloping shell are now put in the swager and more perfectly adapted to each other. This done, the porcelain is taken from the shell. The overlapping corners soldered with a tiny bit of solder, the shell trimmed to conform to the porcelain crown more perfectly, then placed in the cast in the articulator and occlusion and other positions rectified. The porcelain is now taken from the shell and the case invested and soldered, after which the crown may be cemented in its shell receptacle.

This procedure gives a grinding surface of porcelain more efficient than gold, avoids a display of gold on such surface which is especially desirable in the lower jaw, also eliminates the danger of checking the porcelain in soldering, is inexpensive and strong.

\*Clinic given at Lake Erie Dental Association, 1912.

## A METHOD ESPECIALLY USEFUL FOR POSTERIOR LOWER BRIDGE WHERE UPPER TEETH HAVE ELONGATED, LEAVING SCANT ROOM FOR BRIDGE.\*

By Dr. M. A. Payne, Wabash, Ind.

With abutment crowns in place, get impression and bite and articulate. Carve away the lower ridge until you have room enough to adjust plain rubber teeth to articulate with uppers, remove from cast with sticky wax on occlusal ends or drop on plaster, and after it hardens teeth can be removed and invested in plaster, leaving occlusal ends exposed as much as you want the bridge deep. Set ring around them, allowing it to sink into soft plaster, dry out thoroughly and run in die metal, cool, remove, put rubber ring around die and run counter die. Then swage your dummys all in one piece, then swage another and another until you are sure you have strength enough, and solder together. Then either fill with solder or solder piece of plate on under side and adjust in articulator, remove crowns and all, and invest and solder.

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\*Clinic at Indiana State Dental Association, 1912.

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## CASTING RICHMOND CROWNS.\*

By F. E. Yule, D.D.S., Indianapolis, Ind.

After the root is prepared for crowning, burnish a piece of 36-gauge pure gold against the root, get a sharp outline of the root on the gold, remove and trim it to shape of root; replace and fit iridio platinum pin into root, pushing it through the gold; have pin long enough to extend into the porcelain crown; using Steele or other facings, cut off pin down to the gold; solder the gold to pin and replace; burnish the gold tight against the root again, getting a perfect fit; warm a piece of base plate wax, getting it just warm enough to work stiffly; force wax against the root with pin and gold in position; the stiff wax forces the gum margin back and gives a clear field for operation; leave wax in position and get bite; take impression drawing wax and pin, make model of Brophy's investment compound, mount on articulator; select porcelain to suit case, place inlay wax between gold and porcelain, trim wax and remove porcelain from model; remove wax and pin by cutting out the pin from the model; leave the investment material around the pin, it will withstand the heat and will not crack; invest the mass in your investment compound and cast.

The advantages of this method are many. You get a perfect fit against the root, the base of the crown being sharp and smooth, you can study your contact points and articulation and get them absolutely right, as you can see all around the tooth on the articulator, the inlay wax is not forced between the root and tooth by pressure but is waxed into place by the spatula.

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\*Given as a Clinic at Indiana State Dental Society, 1912.



all excess wax can be trimmed away and the case made perfect before investment, and it all can be done in less time than it takes to do it in the mouth. Most dentists will acknowledge that they do not always get a perfect fit by simply placing wax on the porcelain and pressing against the root. This method is ideal for making molar crowns, using saddle-back teeth and carbon point for the Steele all-porcelain tooth.

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### **GOLD INLAYS IN ANTERIOR TEETH.\***

**By C. G. Bailey, Lansing, Mich.**

A great many dentists are not using gold inlays in the anterior teeth on account of believing you have to have more gold showing than you do with the foil filling, but by filling those from the lingual it is not necessary to cut away any more of the labial than is necessitated by the decay itself, to be excavated entirely from the lingual on a right angle. We never depend upon the cement there at all to hold that inlay in. It is held in by having a form groove, a pit in the bottom, and it slips in accurately and is retained there in a dovetail fashion.

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\*Given as a Clinic at Michigan State Dental Society, 1912.

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### **A CASE OF PROLONGED NITROUS OXID AND OXYGEN ANESTHESIA FOR REMOVAL OF IMPACTED LOWER THIRD MOLAR\***

**By J. P. Henahan, D.D.S., Cleveland, Ohio.**

Patient Mr. W., age about thirty-five years, healthy and robust, farmer by occupation, complained of intermittent neuralgic pains involving the entire right side of face.

Examination revealed a fistula on ridge and distal from second molar through which an instrument was passed, and showed the presence of a third molar completely imbedded in the process and soft tissues, and lying with its axis at almost a right angle to the second molar.

Nitrous oxid and oxygen was determined on as an anesthetic to be administered through the nasal inhaler. The patient was placed in chair in an upright position and inhaler adjusted; anesthesia was induced in about seventy seconds, when patient's jaws were distended by means of a Murdoo gag and a corset prop placed as far back as possible on left side. This accomplished a triangular piece of gum tissue, with its apex at the fistula and base at distal surface of second molar was removed. The blood was kept from accumulating by the use of gauze. Then an abrasive disc, charged on one side and edge, was used to grind away enough of the cusps of the impacted tooth to make its upward passage possible. Then

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\*Clinic at Ohio State Dental Society.

with the use of rosebud burs (both straight and right angle) a portion of the process, covering the root and crown, was cut away from the buccal aspect and extending upward and backward along the ridge, always saving as much of the soft tissue as possible, a cavity large enough for the accommodation of an Ash No. 5 elevator was cut under the crown of impacted tooth and a force carefully applied from this point, enough to raise the tooth up, at which time the loose tooth was seized with a pair of molar forceps and removed.

Time of operation, twenty-one minutes, patient remaining unconscious throughout. Teter apparatus used in clinic.

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### PRESIDENT'S ADDRESS\*

By J. W. Stage, D.D.S., Goshen, Ind.

**T**HIS is one of the duties that has come to me for which I am truly grateful, to welcome you to this, our twenty-third annual meeting of the Northern Indiana Dental Society, and it is my sincerest hope that all of you may find it interesting, profitable and enjoyable to a degree never before realized.

May each and every one take this opportunity to listen to these valuable papers; study our instructive clinics and exhibits, and last but *not* least, build a stronger fraternal feeling with your brother practitioner and thus strengthen our efforts for bettering our profession and uplifting individual effort.

It is a great pleasure indeed to be called in convention in this beautiful city of learning on the banks of the Wabash. So near the point of attack of our forefathers with the savages, now we assemble here to discuss the contact point of our molars.

I wish right now to thank the local society and the executive committee and the other officers as well for the time and energy spent in arranging this splendid program which we are about to serve to you; I know that each and every member of the committee has worked long and hard to secure what we now have to offer.

Each year sees our profession broadening out; men's minds become broader, accepting the fact that there are others in the profession who can do things even better than themselves. It has always been my opinion that there was great value in exchange of thought and action.

What an imposition it is to the trusting public to choose a profession and then to be unwilling to improve every opportunity for their betterment and his own enlightenment.

Many of our profession are more than anxious to avail themselves of any new thought, new development or inventive, and are the first to follow the line of clinics at our meetings to inform themselves.

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\*Read before the Northern Indiana Dental Society, 1911.

Now, if a meeting once or twice a year is a good thing, one every month or oftener certainly would be better. I accordingly believe the greatest good can be done this profession by organization down to counties and cities; the petty jealousies must be eliminated from the profession before any great amount of success will be attained along higher educational lines.

The people need compulsory dental inspection in the public schools, and which they cannot appreciate how badly they are in need of; we should take the part of the "wise men," inform them and see that nothing is left unturned to accomplish this great educational movement.

If there is any one thing that is standing in the way of this movement more than any other one thing it is the lack of united action; we expose the lack of sincerity as a profession in our appeal for this advancement when we do not present a united roster. Welcome the day when the dental profession shall be so well organized that they may enter a campaign of this kind with at least 90 per cent of the members of the profession working harmoniously for its adoption.

The condition of the practice of dentistry certainly is in a very satisfactory condition to supply needs.

The people in general are not at want for any services they might desire excepting for the time required to put them into a comfortable state.

With organization would come provision for charity work, placing it where it rightfully belongs. One state that I know of, New Jersey, by the provisions of its last legislature, has provided free clinic work for its needy poor.

It should be regarded a disgrace in this great country of plenty for a child to grow to maturity without the care and attention the oral cavity should receive. Think of the awful loss of those permanent molars, if nothing else. If a "stitch in time" ever saved "nine," it certainly will do so in the early care of the teeth.

Dentistry is no longer a theory, it is a known fact; we positively know what we can do in normal condition and what results can be attained.

The sooner the profession makes the State feel the need of compulsory dental inspection and we bury our petty jealousies and put our shoulders to the wheel of organization and manfully walk up the hill with our banner "Dental Inspection in the Public Schools" unfurled to the winds of progress, then will our efforts be realized and humanity reap the harvest.

**Finish every day and be done with it. You have done what you could; some blunders and absurdities crept in—forget them as soon as you can. Tomorrow is a new day. You shall begin it well and serenely, and with too high a spirit to be encumbered with your old nonsense.**

—Emerson.



**EXTENSIVE NECROSIS WITH SLIGHT DISFIGUREMENT\***

By H. C. Brown, D.D.S., Columbus, Ohio.

The patient was a little girl seven years of age, poorly nourished and undersize.

A physician had sent her to the Children's Hospital as suffering from blood poisoning resulting from an "ulcerated tooth" and in this way I was called to see the case. I found her with a temperature of 103° and a badly swollen and discolored face, which made it difficult to examine carefully. However, it was easily seen that there was more or less necrosis present, and I extracted all the teeth on the side involved, distal to the left temporary lateral and including the first permanent molar. These teeth were extremely loose and very easily extracted, which afforded some relief, but it was necessary for the antrum to be opened, which was done by Dr. F. W. Blake, the rhinologist to the institution. A dental engine was used and the opening made through the nasal wall. This was irrigated for a few days until the child was somewhat improved and later the entire sequestrum was removed, with the second bicuspid and second molar embodied therein and considerable necrosed structure, which extended in all directions, plainly showing the floor of the antrum. Of course, these two permanent teeth were not erupted and only consisted of the crown portion, as no roots had developed. The first bicuspid was visible and was later removed in a similar condition as the others. With but little necessary after-treatment the tissues readily adjusted themselves, with scarcely any disfigurement.

I do not consider that an "ulcerated tooth" was responsible for the condition, neither could I secure any specific history. The child was reported to have had measles twice during the past year, which left her with some ear trouble; this, together with her undernourished condition, was probably responsible for the pathological condition in the antrum and the necrosis resulted from this.

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\*Given as a Clinic at Ohio State Dental Society.

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**THE RESTORATION OF BADLY BROKEN-DOWN ROOTS  
WITH AMALGAM.**

By J. R. Weimer, D.D.S., Wooster, Ohio.

This is a restoration of badly broken-down roots and molars by means of amalgam, using ordinary flat-head brass screws, which may be purchased at any hardware store, for retention. The screw is cemented into the root and amalgam packed about same, with or without matrix as preferred or accustomed, and contoured. By this means roots decayed below the gum-margin may be restored to such an extent that roots may be used for bridge abutments. The idea in using the brass screw is from the fact that the brass is not attacked by the mercury in the amalgam. This method is especially valuable in cases of lower molars, the screw being inserted into the distal root. Nos. 0 and 1 are most convenient sizes, length of about  $\frac{3}{8}$  to  $\frac{1}{2}$  inch, to suit the requirements.

## THE TREATMENT OF CHILDREN

In a consideration of the subject of children as patients, Mr. Fritz Pommer deals fully with the psychology of the situation—the necessity of seeing the dentist from the child's point of view, the mistake of considering children indiscriminately, the ways in which a child's confidence may be gained; perfect honesty, scrupulous keeping of promises, leisureliness and cautious progress, the difficulty of gaining the confidence of a child that has once been shocked or frightened. His method of excavating a child's tooth, when drilling is necessary, is to envelop a sharp rose head bur in a thin coating of cotton wool, to drill slowly and without pressure. By this means a superficial clearing of the cavity may be achieved. With a repetition of the process a little pressure is used, enough to secure that the edges of bur penetrate the wool and cut away the carious portions of the tooth. In most cases the cutting can be done almost without pain. He is of the opinion that even in cases where long and tedious and to some extent painful treatment is necessary, a child who is wisely handled during the process will face further encounters with the dentist with greater equanimity than if the tooth had been simply extracted at the first sitting; and he speaks warmly of the rewards that await the operator who succeeds in face of all difficulties, of the very considerable self-control and endurance displayed by children who have once been won as colleagues, of nervous children who will end by paying their visits unaccompanied.—Abstracted from the *Zahn-technische Rundschau*.

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RELIEVING PAIN DUE TO APPLICATION OF FORMOCRESOL.—The severe pain which frequently follows the application of formocresol, especially in multi-rooted teeth containing vital pulps or fragments thereof, is relieved by removing the formocresol dressing and neutralizing the formalin by ammonia water. This may also be applied in painful dressings of phenol compounds.—*Le Laboratoire et le Progres Dentaire*, per *Dental Cosmos*.

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Brownell says:

“The man who thinks he can't, is right about it”

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Just think you can or what is better still, adopt Chicago's motto and say “I Will,” and then for two days, November eighteenth and nineteenth, you will be in Kalamazoo, attending our annual District Meeting.

Dr. E. S. Barber, we hope, we think, we feel quite sure, will lend us his presence, also a few of his good thoughts, which as you know, are unusually good ones. At this meeting and for the first time, a paper will be read, entitled: “A Dentist is Remembered Not by the Pains he Takes, but by the Pains he Makes.”

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Southwestern Michigan Dental Association

Third and Fourth District

# CORRESPONDENCE

## The Recent Meeting of the National Dental Association.

Dear Mr. Editor:

What about the convention in Washington? I don't want to offend anybody nor to stir up any controversy which would spoil my object in writing this letter. I suspect that many who attended the meeting held just such opinions—expressed opinions sometimes gather together with some force.

To ward off any who will want to take issue with me, I want to say that as a rather constant attendant at the meetings of the N. D. A., this we just held was "head and shoulders" above any previous meeting in dignity, fellowship, freedom from politics, literary merit, scientific merit and mechanical excellence. Then where have I reason to kick?

Was it hot in the Willard assembly room? Then why did they wait until half a hundred people were sick from the intense heat before furnishing fans? Did the hotels stick to their advertised rates? We know many who got rates but also some who didn't. But this is a little matter—dentists make their money so easy, you know.

President Melendy was ideal himself, but some of the section chairmen had little mercy on the baked audience in allowing such long papers and discussions. Scientific subjects may take long papers but no one on earth can take it all in at the reading; why don't they abbreviate and then publish the whole for future study? Some of the essayists did—many thanks from the audience. Take, for instance, Dr. Rhein (who once severely criticised an essayist for the length of his paper) read some forty-five minutes. I will admit he did hold the audience, but many said the last half passed over them, for the length and heat was too much.

The essay of Dr. Rhein will probably be classed as a masterpiece of dental literature on his subject, and I can hardly wait for the proceedings to study it—but just the same the above criticism holds true.

*Limit the time for reading, but publish ad libitum in Transactions.*

Several times the chairman would select a man for discussion and let him talk for half an hour, and when someone got up whom the audience wanted to hear, his time was already taken or he cared not to speak at all.

*Limit the discussion to all alike—favoritism to none.*

Thanks! After two days of sweltering—a cool rain; then fans are placed in the hall.

A stroll over to the Exhibition hall at the Ebbett House finds these men hot under the collar—it seems the committee handed them a lemon—they forgot that the average dentist is more interested in exhibits of practical



things than in convention talk. If this treatment of exhibitors keeps up you will find the manufacturers' exhibit will be better meetings. *Better get together for mutual advantage.*

My! Grieves, of the Clinic Committee, is ideal. The best arranged and conducted clinic I ever saw—but a few *vices in general*: There were a few men who exhibited appliances for the first time; some few of these were instructed to give no information as to who made them or where or when they could be procured. It was often embarrassing to the clinician and his audience. I went there to see and get all new good things. Many men were so afraid when I asked information that they had to slip me a card on the sly, and I had to wait until I got home to write for this information. Suppose I lost these cards. Yet this ban was only put on a few—just the small and useful things. I saw one man who had found out this condition take a delight in standing by these men and enlightening those inquiring as to where they could secure information, etc., about the appliance they were interested in.

One man had a card explaining the detail of his clinic on the wall by the chair; it was gladly taken down by the owner because a few of his personal friends (?) objected to the chairman. But lo and behold, in the afternoon, at the same chair, on the same subject, two cards of similar nature were displayed, and these same gentlemen *stood by* and not a word to the chairman—just a viewpoint which leads me to this suggestion:

Give the clinician full sway; let him tell the history of his invention; who makes it and where it can be obtained. It can't do any harm—it makes the inventor feel good and no dentist ever got rich that way.

Dentists are inventors and they take great interest in what they believe to be the greatest thing ever put before the profession. On the other hand, if he collect a royalty through the supply house, you let him talk—*then why not the other harmless fellow?*

If there is anything I like for a clinician to do, it is to have some printed stuff or reprint about what he is showing. Thank goodness a few broke the forbidding rule and furnished these. I read them coming home on a train and they made their clinic so much more valuable.

*Instead of forbidding—require a printed description or synopsis* to be on table for those interested.

One clinician sent out his brush and mouth wash to a few of his fellow clinicians—an act which was not deserving of such criticism as he received. Had it been on the making of plates or crowns, I wonder if it would have been different? Which leads me to another viewpoint:

Why is it that all men who work Pyorrhea and Oral Hygiene are so criticised? You know them in every city. Did you ever stop to think that generally they are the cleanest, morally and dentally, and have a high class of clientele, yet I can name a dozen such men who have been turned the cold shoulder. *Wonder why?*

Answer—Just because they are cranky as I am or I would not have written this letter. It was a great meeting. May we have another as good.

Respectfully,

ROBIN ADAIR.

# SOCIETY ANNOUNCEMENTS

## Ohio State Dental Society Meeting.

The committees appointed to prepare for the holding of the forty-seventh annual meeting of the Ohio State Dental Society, at Cincinnati, December 3, 4 and 5, 1912, have been and are diligently carrying on their work. The program, as it stands at present, is both unique and interesting: President's Address.....Dr. C. R. Converse, Springfield  
Our Duty in Public Dental Education and Our Relation to the Public

Press.....Dr. H. C. Brown, Columbus  
Oral Surgery..... Dr. G. V. I. Brown, Milwaukee  
Removable Bridgework.....Dr. Chas. F. Ash, New York City  
Instrumentation in Pyorrhea Treatment.....Dr. A. F. James, Chicago  
The Diagnosis of Diseases of the Pulp.....Dr. Herman Prinz, St. Louis  
Lecture: Venereal Diseases, illustrated by stereopticon and moving pictures from actual subjects, by.....E. A. Deeds, Dayton, O.

This lecture has been prepared by the National Cash Register Co., at a cost of about \$15,000. The medical societies before which it has been presented pronounce it a wonderful exhibit. It is needless to call attention to the growing necessity for a thorough understanding of these diseases by the dental profession.

The local Oral Hygiene committee will give a practical exhibition of their school work by having a whole school at work at their own school building, under the direction of the Oral Hygiene committee of the Cincinnati Society, giving every detail of the work from primary examinations up to operative work.

The practical working of all the latest phases of dental radiography will be demonstrated by Dr. Sidney Lange of Cincinnati. One of the most complete outfits will be set up and radiograms taken and developed and finished and delivered on the spot.

The clinics will be very attractive.

The Hotel Sinton will be the headquarters.

## Pennsylvania State Board.

The next examination of the Board of Dental Examiners of Pennsylvania will be held in Musical Fund Hall, Philadelphia, and Dental Hall, University of Pittsburg, on Wednesday, Thursday, Friday and Saturday, December 11, 12, 13 and 14, 1912. Application blanks can be secured from the Department of Public Instruction, Harrisburg.

ALEXANDER H. REYNOLDS, Secretary.

4630 Chester Ave., Philadelphia.

### **Wisconsin State Board.**

The Wisconsin State Board of Dental Examiners will convene in Milwaukee, at the Wisconsin College of Physicians and Surgeons, on Tuesday, December 17th, 1912, at 10 A. M., for examination of applicants to practice in Wisconsin.

High school diploma, application and \$25.00 fee must be filed with the secretary fifteen days prior to above date. Dental diploma to be presented in advance of examination.

F. A. TATE, President,

W. T. HARDY, Secretary,

422 Jefferson St., Milwaukee, Wis.

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### **Minneapolis Dental Society.**

The annual midwinter meeting of the Minneapolis Dental Society will be held in the Masonic Temple, Minneapolis, Minn., on Friday and Saturday, January 24 and 25, 1913.

Space has already been reserved for even a larger manufacturers' exhibit than was given last year. Clinics will be given by some of the best men in the profession, who will demonstrate all of the newest and most useful methods. The entire meeting is to be conducted along unique and original lines—a new method of arranging the exhibits; also many other new things which will add to the pleasure and profit of each visitor.

For information address

O. DeFOREST DAVIS, Secretary,

404 Donaldson Bldg., Minneapolis, Minn.

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### **Chicago Dental Society.**

The officers of the Chicago Dental Society are planning a large celebration for Friday and Saturday, January 31st and February 1st, 1913. The program includes two days of clinics by selected men from all parts of the country, one evening of papers by men of international reputation, concluding the two days' meeting with a testimonial banquet to our esteemed confrere, Dr. Truman W. Brophy, of Chicago.

The dentists of Chicago will make every effort to see that the entire program will eclipse all former meetings. Any dentist who has a new or interesting clinic to give at this meeting is cordially invited to correspond with the chairman of the Clinic Committee, Dr. Fred W. Gethro, 917 Marshall Field Bldg., Chicago, Ill.

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### **The New Jersey State Board.**

The New Jersey State Board of Dental Examiners will hold their regular annual meeting and examination in the assembly chamber of the State House at Trenton, N. J., December 2, 3 and 4, 1912. Application must be filed ten days prior to the meeting. For further particulars apply to the secretary,

CHARLES A. MEEKER, D.D.S.,

29 Fulton St., Newark, N. J.



### Colorado State Board.

The next regular meeting of the Colorado State Board of Dental Examiners will be held at the Capitol in Denver, beginning Tuesday, December 3, 1912. All applications for examination must be filed with the secretary before that date. Examinations are theoretical and practical, and applicants must be prepared to do such practical work as required.

For further particulars address

J. L. HOWELL, Secretary,  
532 Mack Bldg., Denver, Colo.

## New Constitution and By-Laws of the National Dental Association

Unanimously Adopted at Washington, D. C., Sept. 12, 1912.

### ARTICLE I.—*Name.*

The name of this organization shall be the National Dental Association.

### ARTICLE II.—*Object.*

The object of this Association shall be to promote the art and science of dentistry. To achieve this the Association shall endeavor to unite the dental profession of the United States into one compact body, thus creating a power the units of which, working with a harmony of purpose, will foster fraternal relations and intercourse among dentists; safeguard the material interests of the profession; elevate the standards and improve the methods of dental education; secure the enactment and enforcement of just dental laws, while aiming at a unification of State dental statutes, and enlighten and direct public opinion in relation to oral hygiene, dental prophylaxis, and advanced scientific dental service.

### ARTICLE III.—*Membership.*

The membership of this Association shall consist of the present members, and such members of the Constituent Societies, and such members of the Army Dental Corps, and of the Navy Dental Corps, and such others as shall be elected in accordance with the By-laws, as hereinafter provided.

### ARTICLE IV.—*Constituent Societies.*

SECTION 1. State and Territorial Societies which have, or which hereafter may, become organized in conformity with the general plan of the National Dental Association, and which have declared their allegiance to said National Dental Association, and which shall agree to the formation and perpetuation of the House of Delegates, shall be recognized as Constituent Societies.

SECTION 2. The term "State Society" shall be understood to mean the representative dental organization of any one of the States which have been received into the Union, and whose active membership is restricted to legal practitioners practicing within the legal borders of such State. The term "Territorial Society" shall apply in similar manner to the representative dental organization of any of the territorial possessions of the United States. Provided, however, that the term "Territorial Society" shall be held to include the societies of the District of Columbia, of the Canal Zone, and of the insular possessions of the United States.

### ARTICLE V.—*The House of Delegates.*

SECTION 1. There shall be a business body known as the House of Delegates of the National Dental Association. It shall consist of delegates elected by the Constituent Societies, and by the other dental bodies named in Section 2 of this article. The House of Delegates shall represent the delegated powers of the members of the National Den-

tal Association and shall be the national representative body of the Constituent Societies. It shall elect the general officers of the Association and a board of nine trustees, and shall transact all the business of the Association, public, professional, or scientific, not otherwise provided for. The trustees shall be members of the House of Delegates, without the right to vote.

SECTION 2. The total voting membership in the House of Delegates (exclusive of the Board of Trustees) shall be as follows: One delegate shall be allowed from each Scientific Section, from the Army Dental Corps, from the Navy Dental Corps, and one from each Constituent Society. Each Constituent Society shall be entitled to one additional delegate if one hundred of its members become regularly enrolled as members of the National Dental Association; and one more delegate for each additional two hundred members enrolled.

*Explanatory—Regardless of enrollment in the National Dental Association each Constituent Society would have one delegate.*

*With 100 members in the National, 2 delegates.*

*With 300 members in the National, 3 delegates.*

*With 500 members in the National, 4 delegates.*

*With 700 members in the National, 5 delegates.*

*With 900 members in the National, 6 delegates.*

*With 1100 members in the National, 7 delegates.*

*With 1300 members in the National, 8 delegates.*

*With 1500 members in the National, 9 delegates.*

In case any States do not affiliate, all present members of the National residing in such States may meet together at the first meeting of any session of this Association and elect one delegate to represent them in the House of Delegates.

#### ARTICLE VI.—*Sections.*

SECTION 1. This Association shall be divided into three sections as follows:

Section I shall have charge of operative dentistry, nomenclature, literature, dental education and allied subjects.

Section II shall have charge of oral surgery, anatomy, physiology, histology, pathology, etiology, prophylaxis, oral hygiene, materia medica and allied subjects.

Section III shall have charge of prosthodontia, orthodontia, metallurgy, chemistry and allied subjects.

SECTION 2. New sections may be created or existing sections discontinued or modified by the House of Delegates.

#### ARTICLE VII.—*Branches.*

In addition to the existing Southern Branch, the House of Delegates may create such branch organizations as may be deemed essential to the welfare of the National Dental Association and of the dental profession.

#### ARTICLE VIII.—*Annual Sessions.*

The National Dental Association shall hold an annual session at the time and place chosen by the House of Delegates. The time and place for the session, however, may be changed by the unanimous vote of the Board of Trustees, but not later than sixty days prior to the time selected for the session.

#### ARTICLE IX.—*Officers.*

SECTION 1. The general officers of the Association shall be a president, three vice-presidents, a general secretary and a treasurer.

SECTION 2. These officers shall be elected annually by the House of Delegates, to serve for one year, or until their successors shall have been elected and installed.

SECTION 3. No member of the House of Delegates shall be eligible to the office of president or vice-president.

ARTICLE X.—*Board of Trustees.*

SECTION 1. The Board of Trustees shall have charge of the property and of the financial affairs of the Association.

SECTION 2. Three trustees shall be elected annually by the House of Delegates, each to serve for a period of three years.

SECTION 3. No voting member of the House of Delegates shall be eligible to election on the Board of Trustees, but the Board of Trustees after election shall be members of the House of Delegates, without the right to vote.

SECTION 4. No member who has served one full term as a member of the Board of Trustees shall be eligible for re-election on the Board until a period of three years has elapsed, provided that this does not apply to ex-officio members of the Board.

(*Resolved*, That the present Council shall be members of the First Board of Trustees, and shall serve out their present terms, and they shall also be eligible for re-election for one full term of three years.)

ARTICLE XI.—*Dues and Assessments.*

SECTION 1. The annual dues in this Association shall be one dollar.

SECTION 2. Members of the Army and Navy Dental Corps may be elected to full membership, with all privileges, on payment of the annual dues.

SECTION 3. All members of the National Dental Association in good standing shall receive the Journal free. To members of State Dental Societies, not enrolled in the National Dental Association, the subscription to the Journal shall be two dollars; and to all others the subscription shall be three dollars; provided that if this should be in conflict with the rules of the U. S. Postal authorities the Board of Trustees may reduce the general subscription to two dollars.

SECTION 4. In case of need, in order to raise funds, the House of Delegates may order an assessment not to exceed two dollars in one year, for each member; or an assessment not to exceed fifty dollars in one year upon each Constituent Society, but not both.

ARTICLE XII.—*Amendments.*

The House of Delegates may amend or alter this Constitution at any annual session, due notice having been given at a previous meeting of said annual session, provided unanimous consent may be obtained. Otherwise all amendments must lie on the table until the annual session next following their introduction, at which time a two-thirds vote will be requisite for their adoption. In the latter procedure due notice of the substance, or if not too lengthy, the exact wording of the proposed changes must be sent to each member of the House of Delegates with the regular notice of the annual session.

## BY-LAWS

## BOOK I. MEMBERSHIP

CHAPTER I.—*Qualification for Active Membership.*

SECTION 1. A member in good standing of a Constituent Society shall be eligible for membership in the National Dental Association on presentation to the general secretary of the following: (1) Satisfactory evidence of the above; (2) written application for membership on the prescribed form; (3) the annual dues.

SECTION 2. Members of the Army and Navy Dental Corps may become members in like manner, upon presenting satisfactory evidence of membership in said Corps.

SECTION 3. Members must retain their membership in Constituent Societies. Upon official notification from a Constituent Society that a member has lost this qualification, the secretary will erase the delinquent's name from the roll of membership of this Association, and notify him of this action, stating the reason therefor.

SECTION 4. Any member who has forfeited his membership in accordance with Section 3 shall be reinstated on his request by the general secretary, on presentation of satisfactory evidence that his qualification has been restored by the Constituent Society.



SECTION 5. Any member who shall fail to pay his annual dues for one year, unless absent from the country, shall be dropped from the roll of members, provided that due notice shall be previously given to the member by the general secretary. Any member who has been suspended for non-payment of dues shall be restored only when all his dues have been paid.

SECTION 6. A member who becomes a resident of another State, to retain his membership in the National Dental Association must become a member of the Constituent Society in the State to which he has removed.

#### CHAPTER II.—*Registration.*

SECTION 1. No member shall take part in the proceedings of the Association or of any of the Sections until he has registered his name and address with the proper officer or committee and has paid his annual dues for the current year.

SECTION 2. A member desiring to take part in the scientific work of the American shall indicate, when registering, the section in which he wishes to be enrolled.

#### CHAPTER III.—*Delegated Members, Honorary Members, Associate Members, etc.*

SECTION 1. Members delegated to the House of Delegates shall register and pay their annual dues, thus qualifying as members of this Association, before taking their seats in the House of Delegates.

SECTION 2. Dentists who have risen to pre-eminence in foreign countries shall be eligible to honorary membership. They may be elected by the House of Delegates on nomination by a Section, but not more than three honorary members shall be elected in any one year.

SECTION 3. Associate membership may be granted by the House of Delegates to distinguished visitors. Such membership accords all privileges for one year, including the Journal of the Association.

SECTION 4. Membership of all classes may be declared forfeited by the House of Delegates for reasons considered sufficient by that body.

#### BOOK II. DELEGATES

##### CHAPTER IV.—*Qualifications, Terms, Apportionment and Registration of Delegates and Alternates.*

SECTION 1. No one shall serve as a member of the House of Delegates who is not a member of this Association.

SECTION 2. Delegates and alternates from the Scientific Sections and from the Army and Navy Dental Corps shall be elected for one year. Delegates and alternates from Constituent Societies shall be elected for two years. Constituent Societies entitled to more than one delegate shall elect them so that one-half, as near as may be, shall be elected each year.

SECTION 3. Beginning with the annual session of 1913, the House of Delegates shall be constituted as described in Article V of Section 2 of the Constitution. The number of delegates to which each Constituent Society may be entitled shall be based on the number of members from whom dues for the current year shall have been received by the General Secretary of this Association at least thirty days prior to the first day of the annual session of this Association.

SECTION 4. In the cases of those Constituent Societies which do not hold meetings of the current year at least forty-five days prior to the Annual Session of this Association, the number of delegates shall be estimated on the dues for the previous year received by the General Secretary of this Association.

SECTION 5. To be represented in the House of Delegates the officers of each Constituent Society shall file with the General Secretary of this Association, at least thirty days prior to the first day of the Annual Session, a list of the names of its delegates and alternates.

SECTION 6. Previous to the Annual Session the General Secretary of this Association shall prepare and have printed a list of the delegates and alternates elected by the various Constituent Societies; also the number of paid members of each. In case any Society has elected more delegates than the number to which its paid membership shows it to be entitled, the General Secretary in preparing the list shall drop one or more names from the list from such Society, beginning at the bottom of the list, until the proper number of names remain.

SECTION 7. At any election of delegates, the body electing may at the same time elect as many alternates as delegates, and the alternate of each delegate may sit in his stead in the House of Delegates in the absence of the regular delegate from any annual session, except as provided in Section 9 of this chapter.

SECTION 8. Every delegate must present his credentials and be duly registered by the General Secretary, or other designated officer or committee before taking part in the business of the House of Delegates. Credentials shall include a certificate duly signed by the proper officials of the body delegating him, and such other evidence as may be required.

SECTION 9. The credentials of a delegate having been accepted and his name placed on the roll of the House of Delegates, he shall remain the duly accredited delegate of the body which he represents until final adjournment of the session, and his place shall not be taken by any other delegate or alternate.

#### CHAPTER V.—*Procedure of House of Delegates.*

SECTION 1.—*Order of Business.*—The following shall be the order of business, unless changed by unanimous consent:

1. Call to order by the President.
2. Roll call.
3. Reading and adoption of minutes.
4. Reports of officers.
5. Reports of committees.
6. Unfinished business.
7. New business.

SECTION 2. No new business shall be introduced into the House of Delegates on the last day of the annual session unless with unanimous consent; and such new business, whether in the form of a resolution, memorial or otherwise, shall require a unanimous vote for final action.

SECTION 3. The House of Delegates shall be governed by Roberts' Rules of Order, when not in conflict with these By-Laws or with the rules of the House.

SECTION 4. One-fifth of the voting members of the House of Delegates shall constitute a quorum.

#### CHAPTER VI.—*Meetings of the House of Delegates.*

SECTION 1. The House of Delegates shall meet annually on the day preceding the opening of, and at the same place as, the annual session of the Association.

SECTION 2. Special sessions of the House of Delegates shall be called by the President, on written request of a sufficient number of delegates to represent a majority of the Constituent Societies by mailing a written or printed notice to the last known address of each delegate, at least twenty days before such special session is to be held, in which shall be specified the time and place of meeting and in general terms the objects of such special session, and no other business shall be transacted thereat. The time and place for the meeting of a special session must be given in the requests signed by the delegates.

#### CHAPTER VII.—*Nomination, Election and Installation of Officers, Trustees, Honorary Members, Associate Members, etc.*

SECTION 1. Nominations for office, except that of treasurer, shall be made orally, but no nominating speech shall exceed two minutes in length. Any nominee receiving

the majority of the votes cast shall be declared elected. The treasurer shall be nominated by the Board of Trustees, who shall present two names.

SECTION 2. All elections shall be by ballot, and a majority of the vote cast shall be necessary to elect. In case no nominee receives a majority of the votes on the first ballot the nominee receiving the least number of votes shall be dropped and a new ballot held. This procedure shall be continued until one of the nominees receives a majority of all votes cast, when he shall be declared elected.

SECTION 3. The election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the afternoon of the third day of the annual session.

SECTION 4. Nominations for honorary membership from the Sections shall be referred without debate to the Committee on Sections and Section Work, which shall consider the relative scientific attainments and professional character of the nominees, and shall report its conclusions to the House of Delegates for action. The election of honorary members shall immediately follow the election of officers.

SECTION 5. Nominations for associate memberships may be made by the Sections at any meeting of the House of Delegates, and may be confirmed, with or without reference to the Committee on Sections and Section Work, at the will of the majority of the House of Delegates.

SECTION 6. The general officers of the Association shall be installed at the close of the last meeting of the annual session, at which they are elected.

### BOOK III

#### CHAPTER VIII.—*Officers, Trustees and Committees.*

SECTION 1.—*President.*—The President shall preside at the general meeting and at the meetings of the House of Delegates, and shall perform such duties as custom and parliamentary usage require. On the morning of the first day of the annual session following his election he shall deliver an address at the general meeting not exceeding forty minutes in length.

SECTION 2.—*Vice-Presidents.*—The Vice-Presidents shall assist the President. During his absence or at his request one of them shall officiate in his place. In case of the death, resignation or removal of the President, the vacancy shall be filled by the ranking Vice-President.

SECTION 3.—*General Secretary.*—The General Secretary shall give due notice of the time and place of all annual and special sessions of the Association and of the House of Delegates, by publishing the same in the Journal of the National Dental Association and other journals. He shall notify members of committees of their appointment, and of the duties assigned to them. It shall be his duty to verify the credentials of members of the House of Delegates and to provide a registration book for them, in which shall be recorded the name of each delegate in attendance at each session. He shall collect all dues and transmit the same to the treasurer, as may be directed by the Board of Trustees, and as receipt for dues shall issue certificates of membership. He shall conduct all correspondence required of him by the Association or by the House of Delegates, or which may become necessary in the rightful conduct of his office. He shall keep in separate books the minutes of the general meetings and of the House of Delegates. He shall prepare a roll of the delegates attending each session to facilitate voting by roll call. He shall prepare for publication the official program of each session, and shall perform such other duties as may be directed by the Association or by the House of Delegates, and shall receive a salary to be fixed by the Board of Trustees.

SECTION 4.—*Treasurer.*—The Treasurer shall be the custodian of all moneys, securities and deeds belonging to the Association, and shall hold the same, subject to the direction of the Board of Trustees. He shall give to the Board of Trustees a suitable bond, and shall receive a salary to be fixed by the Board of Trustees.



CHAPTER IX.—*Board of Trustees.*

SECTION 1. The Board of Trustees shall have charge of all properties and of the financial affairs of the Association. At the first meeting of the Board after the annual session of the Association it shall organize. In addition to the nine elected members of the Board of Trustees, the President and General Secretary shall be *ex officio* members and shall hold the same positions in the Board as in the Association, but the Board shall elect a Recording Secretary, who shall keep its records and make its reports.

SECTION 2.—*Journal.*—It shall be the duty of the Board of Trustees to provide for and superintend the publication of the Journal of the National Dental Association, and of all proceedings, transactions, and memoirs of the Association. It shall have full discretionary power to omit from the Journal of the National Dental Association, in part or in whole, any paper that may be referred to it by any of the Sections. It shall appoint a general manager and editor of the Journal, which two positions may be held by one person, and such assistants as may be necessary, and shall determine the terms and conditions of their employment.

SECTION 3.—*Meetings During Annual Sessions.*—During the annual session of the Association the Board shall hold meetings as often as may be deemed necessary by the President, and all matters referred to it by the House of Delegates shall be reported on within twenty-four hours, if so ordered by the House.

SECTION 4.—*Board Reports.*—The Board of Trustees shall have the accounts of the Treasurer and of the Journal office audited annually, or oftener if deemed necessary, and shall make an annual report on the same to the House of Delegates, which report shall also specify the character and cost of all the publications of the Association during the year and the amount of all property belonging to the Association.

SECTION 5.—*Vacancies.*—In case of vacancy in the office of Treasurer or Board Secretary, the vacancy shall be filled by the Board of Trustees.

SECTION 6.—*Salaries.*—The Board of Trustees shall fix the salaries of the General Secretary, the Treasurer, the Board Secretary and of the Journal manager and the editor.

SECTION 7.—*Regular Meetings of Board.*—Regular meetings of the Board of Trustees shall be held immediately after the annual session of the Association and at the same place, and on the first Monday in the month of February, of each year, at such place as the Board may select at its first meeting.

SECTION 8.—*Special Meetings of Board.*—Special meetings of the Board of Trustees may be called at any time by the President or by request of five members of the Board, due notice of which must be given to each member of the Board at least five days in advance of the meeting. The general object of a special meeting must be stated in the notice, and no other business may be transacted.

SECTION 9.—*Annual Sessions, Exhibits, Clinics and General Arrangements.*—The Board of Trustees shall have full control of all arrangements for the annual sessions, and shall provide meeting places for the Association, the House of Delegates, and the various Sections. It shall also have control of all clinics and of all exhibits. The Board of Trustees in their discretion may appoint a local committee of arrangements, which shall at all times be under the control of the Board of Trustees.

CHAPTER X.—*Committees.*

SECTION 1. Committees shall be classified as (a) standing committees, (b) reference committees, (c) special committees. These committees shall be nominated by the President and elected by the House of Delegates, unless otherwise provided.

SECTION 2.—*Committees, Appointments and Powers.*—Reference committees shall be nominated from among the House of Delegates, but any member of the Association shall be eligible to serve on standing or special committees. All members of committees who are not members of the House of Delegates shall have the right to present their reports in person to the House of Delegates, and to participate in the debate thereon, but shall not have the right to vote.

SECTION 3.—*Standing Committees.*—Standing committees shall be as follows:

- (a) A Judicial Council.
- (b) A Committee on Dental Education.
- (c) A Committee on Dental Legislation.
- (d) A Committee on Transportation and Place of Session.

SECTION 4.—*Judicial Council.*—The Judicial Council shall be composed of five members to be appointed by the President on the first day of each annual session from the delegates present, and to continue in office until their successors are appointed. It shall organize by electing a chairman and a secretary. The latter shall keep a permanent record of its proceedings, shall conduct all correspondence, etc. The Judicial Council shall hold such meetings during the annual session, and during the year, as it may deem necessary. Three members shall constitute a quorum. It shall make an annual report of its proceedings to the House of Delegates. To this Council shall be referred all questions, complaints, protests, and matters of an ethical nature. When such complaints, protests, etc., concern an individual's relations with his local or State society, they shall be considered by this Council only after the same shall have been referred to the Constituent Society concerned, or on an appeal from such Constituent Society. Its decisions shall be subject to appeal to the House of Delegates.

SECTION 5.—*Committee on Dental Education.*—The Committee on Dental Education shall consist of five members. One member shall be elected to serve one year, one for two years, one for three years, one for four years, and one for five years. Thereafter one member shall be elected each year to serve five years. The committee shall organize, shall elect a Chairman and Secretary, and shall adopt such regulations for the government of its actions as it may deem expedient. It shall expend money or contract financial obligations only as shall be authorized in writing by the Board of Trustees. The functions of the Committee on Dental Education shall be: (1) To make an annual report to the House of Delegates on the existing conditions of Dental Education in the United States. (2) To make suggestions as to the means and methods by which the National Dental Association may best influence favorably dental education. (3) To act as the agent of the National Dental Association under instructions of the House of Delegates, in its efforts to elevate the standards of dental education.

SECTION 6.—*Committee on Dental Legislation.*—The Committee on Dental Legislation shall consist of five members. One member shall be elected for one year, one for two years, one for three years, one for four years, and one for five years. Thereafter one member shall be elected each year to serve for five years. The committee shall organize, shall elect a Chairman and Secretary, and shall adopt such regulations for the government of its actions as it may deem expedient. It shall expend money or contract financial obligations only as shall be authorized in writing by the Board of Trustees. This committee shall have the authority to appoint a sub-committee, consisting of one member from each Constituent Association, and shall have the power to co-operate with the officers of the State and local societies, and with the chief officers of the United States Army and Navy in regard to legislation affecting the welfare of dentistry. The Committee on Dental Legislation shall report to the House of Delegates at each annual session its proceedings during the previous year, and shall recommend such action in respect to pending legislation as it shall deem proper.

SECTION 7.—*Committee on Transportation and Place of Sessions.*—The Committee on Transportation and Place of Sessions shall consist of five members. The chairman shall be selected to serve for three years; the other four members shall be appointed by the President annually, one of whom shall reside in the place chosen for the next annual session. Invitation for the Association to convene in any city or place shall be presented to this committee, whose duty it shall be to recommend to the House of Delegates the places available for an annual session, with advantages and disadvantages of each. The Committee shall secure railroad rates for the annual session and shall publish same

in the Journal of the National Dental Association, and other journals, at the earliest possible time prior to the date of the annual session.

SECTION 8.—*Reports of Standing Committees.*—The reports of standing committees shall, as far as possible, be transmitted to the General Secretary ten days before the date of the annual session, and he shall have them printed for distribution to members of the House of Delegates at the first meeting of the annual session.

SECTION 9.—*Reference Committees.*—(a) Immediately after the organization of the House of Delegates, at each annual session, the President shall appoint from among its members such committees as may be deemed expedient by the House of Delegates. Each committee shall consist of three members unless otherwise provided, the chairman to be specified by the President. The members of these committees shall serve during the session at which they are appointed.

(b) To the appropriate committee shall be referred resolutions, measures, and propositions presented to the House of Delegates before final action shall be taken, unless otherwise unanimously ordered by the House of Delegates.

(c) Each reference committee shall, as soon as possible after the adjournment of each meeting, or during the meeting, if necessary, take up and consider such business as may have been referred to it, and shall report on the same at the next meeting, or when called on to do so.

(d) The following reference committees are hereby provided:

1. A Committee on Sections and Section Work, to which shall be referred all business relating to the Sections.
2. A Committee on Rules and Order of Business, to which shall be referred all matters regarding rules governing the action, methods of procedure and order of business of the House of Delegates.
3. A Committee on Dental Education, to which shall be referred all matters relating to dental colleges and dental education. The members of the standing Committee on Dental Education shall be *ex officio* members of this reference committee.
4. A Committee on Legislation, to which shall be referred all matters relating to State and national legislation. The members of the standing Committee on Dental Legislation shall be *ex officio* members of this reference committee.
5. A Committee on Amendments to the Constitution and By-Laws, to which shall be referred all business relating to this subject.
6. A Committee on Reports of Officers, to which shall be referred the President's address and the Secretaries' and Trustees' reports.
7. A Committee on Credentials, to which shall be referred all questions regarding the registration and the credentials of delegates.
8. A Committee on Miscellaneous Business, to which shall be referred all business not otherwise disposed of.

#### BOOK IV

#### CHAPTER XI.—*General Meetings.*

SECTION 1.—*Time of General Meetings.*—The general meetings shall be held at 10:30 A. M. and 8 P. M. of the first day of the annual session, and at 8 P. M. of the subsequent days.

SECTION 2.—*Addresses.*—At the first general meeting shall be delivered the address of the President, whose recommendations shall thereon go to the House of Delegates for action. The balance of the time of the first meeting shall be devoted to such other addresses as may be provided. The first evening meeting shall be devoted to a paper recommended by Section 1, the second evening meeting to a paper recommended by Section 2, and the third evening meeting to a paper recommended by Section 3.



SECTION 3.—*Order of Business.*—The order of the first general meeting shall be as follows:

1. Calling the meeting to order.
2. Prayer.
3. Address of Welcome and Response.
4. Report of Committee of Arrangements.
5. President's annual address.
6. Discussion of President's address.
7. Literary program.
8. Adjournment.

#### CHAPTER XII.—*Sections.*

SECTION 1.—*Meetings.*—Each Section shall hold its first meeting at 2 p. m. of the first day of the annual session, and on each subsequent day at 9 a. m., until the program is completed or as the Section may decide; provided that a Section shall hold no meeting that will conflict with a general meeting.

SECTION 2.—*Officers of Sections.*—The officers of each Section shall consist of a chairman, vice chairman and a secretary. These shall serve for one year, or until their successors are elected and qualify; provided that each Section may elect its secretary to serve a longer time at its discretion. Each Section shall also elect annually one representative and an alternate to the House of Delegates of the National Dental Association, to serve for one year.

SECTION 3.—*Election of Officers.*—The election of officers of each Section shall be the first order of business of the morning meeting of the last day of each annual session.

SECTION 4.—*Duties of Section Officers.*—(a) Each chairman shall perform the usual duties of such office, and shall co-operate with the Section Secretary, in procuring papers and in the arrangement of the program for his Section. (b) Each vice-chairman shall assist his chairman, and take his place when necessary. (c) Each secretary shall keep the records of the Section in a book provided for such purpose; shall, with the co-operation of the Chairman, conduct all correspondence necessary to secure papers and perfect the program for his Section; and he shall forward to the General Secretary, at least forty days prior to the date of the annual session, a copy of his Section program for insertion in the official program, and shall perform all other duties pertaining to the office of Secretary.

SECTION 5.—*Executive Committee.*—Each Section shall have an Executive Committee, which shall consist of the last three retired chairmen. In the absence of a member of this committee the acting chairman shall sit in his stead. At the first organization of each Section, in 1913, an Executive Committee of three shall be elected, one to serve for one year, one for two years, and one for three years, by which time the Executive Committee will be constituted as above provided. The Executive Committee shall examine and pass on all papers read before the Section, and shall indorse for publication only those that are of scientific or of practical value; it shall also examine all papers offered to the Section prior to the reading thereof, and shall choose the one to be read before the general meeting devoted to the work of its particular Section, and such paper shall not be read before the Section meeting.

SECTION 6.—*Honorary and Associate Members.*—Each Section, at its opening meeting, may make nominations for honorary and for associate members, in accordance with Sections 2 and 3 of Chapter III. The Secretary shall immediately notify the General Secretary of such nominations.

#### CHAPTER XIII.—*Papers and Discussions.*

SECTION 1. Titles and abstracts of papers offered to Sections must be in the hands of the Section Secretary at least thirty-five days prior to the annual session.

SECTION 2. The time allowed for the presentation of a paper before a Section shall

be limited to thirty minutes, except by unanimous consent. No one shall address a Section more than once on the same subject, nor for longer than five minutes, except with the consent of the majority of those present.

SECTION 3. Each Section may provide by-laws for its own government, provided these by-laws do not conflict with the Constitution and By-Laws of the Association.

#### CHAPTER XIV.—*Publication.*

SECTION 1. No paper shall be published as having been read before a Section unless it has received the approval of the Executive Committee of said Section.

SECTION 2. Each author shall hand his manuscript to the Section Secretary immediately after the reading thereof, and such manuscript must be ready for publication at that time, and must be accompanied by copy for all illustrations needed. The Secretary shall indorse thereon that it has been read, and shall hand it to the Executive Committee for its action. All papers approved by the Executive Committee shall be returned to the Section Secretary, who shall at once forward them for publication to the editor of the Journal.

SECTION 3. No paper shall be published as having been read before a Section unless it has actually been read, or unless, for special reasons, when the author has been present and prepared to read the paper, the Section shall vote to have it read by title.

SECTION 4. All papers and reports presented to a Section, and approved by the Executive Committee, shall become the exclusive property of the Association, provided that the Board of Trustees may permit an author to publish his paper elsewhere than in the Journal of the National Dental Association.

SECTION 5.—*Official Resolutions Approved by the House of Delegates.*—No memorial, resolution, or opinion of any character whatever shall be issued in the name of the National Dental Association, unless it shall have been approved by the House of Delegates.

#### BOOK V. AMENDMENTS

#### CHAPTER XV.—*Articles of Incorporation.*

SECTION 1. The House of Delegates at any annual session, wherever the same may be held, may instruct the Board of Trustees to make any changes in the articles of incorporation in accordance with the law, which may appear desirable or which may be made necessary, by any change or amendment to the Constitution and By-Laws of this Association.

SECTION 2. These By-Laws may be amended on a two-thirds vote of the House of Delegates, provided that no amendment shall be acted on till the day following that on which it is introduced; except that the Board of Trustees may by unanimous vote make such changes, and such changes only as may be required to adapt them to the rules and regulations of the United States postal authorities.

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### Anvil Sparks

Who persists in sin believes a lie.

Foolishness is not in the lack of brains, but in the silly use of them.

The road by which one runs away from duty is an air-line to trouble.

A sacrifice that is still regretted has not yet found its way to the altar.

Losing the spirit of youth, and not the passing of the years, brings age.

The devil never cares how many resolutions you make to reform tomorrow.

No vice is too little to be feared; the microbes of some diseases are so minute that they have never yet been discovered.

# NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

## WHAT IS DOING IN THE SOCIETIES

### Southwestern Michigan Dental Society

The regular meeting of the Southwestern Michigan Dental Society will be held at the Burdick Hotel, Kalamazoo, Mich., Nov. 18 and 19. The convention hall of this hotel has been secured for this meeting. The officers and committee are making every effort to have an unusually good program. Please remember the dates.

R. E. PATTERSON, Sec'y.

### New Mexico

Roswell, N. M.—At the closing session of the New Mexico Dental Society's convention here the following officers were chosen for the ensuing year: President, D. W. Cornell of Gallup; vice president, C. M. Stancliffe of Tucumcari; second vice president, W. J. Armstrong of Roswell; secretary, C. A. Eller of Albuquerque.

### African State Society of Arkansas

Little Rock, Sept. 19.—Negro dentists of Arkansas organized a State Dental Association yesterday at a meeting held at the home of R. H. Meaddough, who was elected president of the organization. H. W. Douglas of Little Rock was elected first vice president; A. A. Marquis, Helena, second vice president; H. H. Stolson, Forrest City, corresponding secretary; F. Lytes, Pine Bluff, recording secretary; H. A. Powell, Madison, assistant secretary, and J. W. Parker, Pine Bluff, treasurer.

### The Hocking Valley District

New Lexington, Ohio, Oct. 17.—The Hocking Valley Dental Society held its regular meeting Monday afternoon at the office of Dr. Embrey at Pleasantville. The following dentists were in attendance: C. W. Outcalt, J. J. Stukeley, Lee O'Grady, J. H. Stuckey, W. C. Graham, Ray Peters, of Lancaster; J. C. Stover of Basil; Dr. Kelso, of New Lexington; Dr. Vosper of Crooksville.

A splendid paper was read by Dr. Kelso on "Prophylactic Antisepsis." Dr. Embrey served refreshments and cigars. The society, as a component of the State Society, has made application to join the National Dental Association.

### After Bushwhackers

Pittsburg, Pa., Oct. 3.—Men who are practicing dentistry without licenses, and those calling themselves "doctor" without holding such degree from approved colleges or universities, are in danger of falling into the hands of detectives who are being employed by the State Dental Society in a state-wide campaign against such "quacks." A. J. Scott, a detective in the employ of the society, is in Pittsburg now gathering evidence against several practitioners who are alleged to have been working without licenses.

Altoona, Pa., Oct. 7.—Following a state-wide crusade against dentists who are practicing in this State without having obtained a license from the State Dental Board, which began some time ago, five well-known dentists in this city were arrested today on information sworn to by Andrew J. Scott, a Philadelphia detective, employed by the State Board.

### The Central Pennsylvania

Johnstown, Oct. 10.—Dr. C. R. Grissinger, of Bedford, was elected president of the Central Pennsylvania Dental Society; J. G. Broad of South Fork, vice president; H. E. Crumbaker, of Altoona, re-elected secretary, and L. M. Nugent, of Altoona, was named as treasurer. The composition of the new council: Three years—William Ankney and H. C. Hinchman, both of Johnstown; two years: C. J. Cameron of Cherrytree and C. W. Brown of Altoona; for one year: W. M. Bolger of Martinsburg and J. G. Broad of South Fork. "The Business Side of Dentistry" was the subject of a paper by Dr. F. I. Shaffer yesterday. Following an address by Lee L. Smith, it was decided by the society to purchase a moving picture machine that would enable the showing of the care of children's teeth in the cities and towns embraced within the scope of the society. The convention closed tonight with a well attended public lecture in the Johnstown High School auditorium by Dr. William Belcher of Rochester, N. Y.



# THE DENTAL SUMMARY

The Magazine That Helps

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## OFFICIAL ORGAN

The Ohio State Dental Society  
The Michigan State Dental Society  
The Indiana State Dental Society  
The Kentucky State Dental Society  
The Louisiana State Dental Society  
The West Virginia State Dental Society

The Northern Ohio Dental Society  
The Northern Indiana Dental Association  
The Eastern Indiana Dental Society  
The Southwestern Michigan Dental Society  
Odontological Society of Western Pennsylvania  
The Lake Erie Dental Society

and Several Local Dental Societies

Editorial Office; 1255 Neil Avenue, Columbus, Ohio  
L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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## ESTHETICS OF DENTAL PROSTHESIS.\*

(Stereopticon Lecture)

By George H. Wilson, D.D.S., Cleveland, O.,

IT IS REGRETTABLE that Professor Turner could not be with us at this time to give a paper on practically the same subject. We know his ability, the amount of work he has been doing in various ways, and his desire to be with us, but the amount of work that has been required of him for many months past has so reduced his vitality that he did not feel justified in leaving home at this time. He is a man of great energy and of a strongly nervous temperament; with such a make-up there is always a possibility of exhaustion. While his decision to cancel his appointment with our society was wise and necessary, nevertheless we regret that we cannot have the inspiration he would have given us.

The subject we have to consider is a very important one. We will

\*Revised from the Lecture given at the Ohio State Dental Society, Dec., 1911.

define the term Dental Prosthesis as the science, art and esthetics of restoring a lost dental organ or organs and associate parts with an artificial substitute. To fully appreciate the meaning of this term it is necessary to have a clear idea of the three terms, "science," "art" and "esthetics." "Science," of course, we consider as classified knowledge. "Art" has a double meaning. It means doing anything in a skilful manner. If it is nicely done it makes no difference whether it is fine art or utilitarian work, or whether it applies to that class of practice known as "practical" or to what we call ideal. To make a distinction we have introduced the two terms, "art" to represent the well executed manual part of our work, and "esthetics" to represent the ideal, the beautiful. It is necessary to have the ideal or the beautiful in order to secure the best results. Dentistry consists of two departments: one, the profession, and the other the manufacturers. The dental profession consists of general practitioners and specialists. Specialists may be operators, prosthetists, orthodontists, oral surgeons or prophylaxists. When we speak of the general practitioner we mean, necessarily, the man who is doing everything in dentistry. An operator may have a man in the laboratory to do the mechanical part of the work. The operator, assuming the responsibility, looking after the art side as well as directing the mechanical, is therefore a general practitioner just as much as though he did the work himself. To have an assistant in the office for a special line of work makes no difference, as we are the responsible person in the eyes of the law, consequently it is general practice. If a man wishes to be an operator only, he excludes the other specialties and devotes himself strictly to the treating of the natural teeth. The operator refers his patients requiring services in other departments of dentistry to a suitable specialist, assuming no responsibility nor compensation other than a consultation fee.

There are two classes of manufacturers: the manufacturer of instruments and apparatus and the manufacturer of appliances. The manufacturer of appliances is the man who devotes himself to laboratory work, serving other dentists in preparing special appliances for the mouth. This is no disrespect to the laboratory man. I do not in the least wish to be so construed. However, they cannot be considered as belonging to the profession, because they are simply manufacturers. They have no responsibility so far as the patient is concerned. The man who takes the impression and adjusts the appliance is the one who is responsible, for he is doing the professional work and receiving the professional fee. I wish to impress upon this audience that all who assume the responsibility of general practice and desire to render the best service for the patient must be interested in the esthetics of prosthetic dentistry. The orthodontists are interested in dental esthetics because it is a fundamental of their art. The oral surgeon would have no special interest in esthetics, nor has the prophylaxist; but

the operator, orthodontist, general practitioner and prosthetist must be interested in this subject; therefore I feel that in addressing you today I am excepting very few.

In considering art there must be some general principles on which we build our ideas; however, it does not mean that every case should be brought to an ideal, but we must have an ideal with which to compare. Therefore, the great standard which is placed before us is the Apollo Belvedere



Fig. 1

(Fig. 1). A line is drawn and divided into three equal portions to show the relative proportions of the face. This line and the face should be studied that we may understand the general principles. There are few such well-balanced faces in Nature. It serves as an ideal with which to make comparison. The ideal face has three equal portions as would be represented by drawing a line at slightly an obtuse angle from the perpendicular at the base of the chin, and may be called the base line. The other three lines are drawn parallel with this base line, one at the base of the nose which marks the lower end of the lobe of the ear, another at the bridge of the nose which marks the top of the ear, while the third is at the top of the forehead and marks the ideal hair line. The space occupied by the hair on top of the head is supposed to be equal to a third of the face. Notice the relation of the lips to the perpendicular line. The line just touches the lower lip (also the chin) and the upper lip extends a little over. The line passes through the middle of the wing of the nose and touches the frontal eminence of the forehead. Now, as I have said that this is only an ideal, I wish to read to you a few quotations in confirmation of the truth of this statement. The first one is from Lavater, the Swiss minister or priest who wrote extensively upon physiognomy. We are not interested in the physiognomical significance of the face, but we are interested in the study of its proportions and harmony. Lavater says: "However famous and extolled the forehead of the Vatican Apollo may be, and however it may be deserving of its fame, I cannot discover its greatness and perfection. It may be answered, it is the forehead of a god, and so be it; but nothing is, in my opinion, divine which has no similitude to the human. We cannot here discover whether it is the forehead of a man, woman or deity, or rather, we know it



neither is, nor can be either. . . . The beautiful proportions of the whole are so majestic that we imagine we contemplate something more than human."

In another place he says: "I maintain that nothing resembling it can be found in Nature. We know no forehead, no nose, much less can we imagine such an ideal pattern of perfection in which the outline is, for the thousandth part of an inch, rectilinear. Such a forehead may dominate, pursue goddesses, persecute enemies, may, in comparison with a thousand feeble ones, be called royal, yet it is not true, cannot think; and the forehead which does not think can as little be called beautiful or true as an eye which does not, cannot see."

Dr. Angle, quoting from Mr. Wuerpole, says: "But to use Grecian, or the Roman standard as a gauge for the types of the present day, especially in America, is impracticable." Also: "The ability to determine the proper balance of the features is rare, that only one in two or three hundred of even art students ever succeed in mastering it. It is, furthermore, a law so plain and so simple that all can understand it. It is that the best balance, the best harmony, the best proportions of the mouth in its relations to the other features require that there should be *the full complement of teeth, and that each tooth should be made to occupy its normal position — normal occlusion.*"

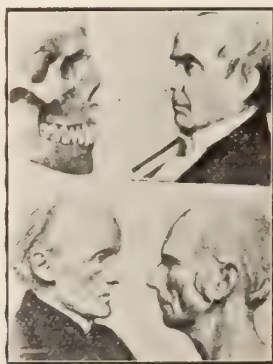


Fig. 2

So we see Lavater's idea, as he wrote in 1775, was that the Apollo is not human, that it is not divine, but is an ideal. I have heard men on the floor talking before dental audiences say that when a set of artificial teeth are being constructed for the mouth we should open or close the mouth so that the length between the nose and chin will be the same as the length of the nose. It is simply absurd. If we look over this audience we will not find anyone with features so finely divided.

The picture at the left is for the express purpose of indicating the conditions we really have in Nature. Notice the length between the base of the chin and the base of the nose, and then the middle third indicated by the nose, and also the forehead. Notice the length of the ear, that it is

fully as long as the lower third, but much longer than the middle third of the face. Thus we see the necessity of an ideal for comparison; however, this face is typical of those we have in practice, that is, anything but ideal. The teeth are worn down at least one-third, so that the lower third of the face, when the mouth is closed, is shorter than in young manhood. If the teeth were extracted and replaced with teeth the size and length of youth, the appliance would be monstrous. If an attempt should be made to close the mouth so that the lower third would be equal to the middle third, what would be the result? We must study the whole physiognomy of the being, make comparisons with the ideal and strive for the harmonious.

Here is a group that some of you may have noticed, as published by Dr. Cigrand in his book, "The Lower Third of the Face," representing the different profiles. Let us consider this skull to see how nicely the teeth are intercuspsated so that they appear perfect. Observe the condyle. If the mandible is moved forward it must pass down the eminentia articularis. In another case the path may be horizontal or nearly perpendicular. Generally it is oblique, therefore as the chin is carried forward the ramus of the jaw drops and there is a space between the molar teeth. A little later we will show a series of three slides to demonstrate the effect in artificial dentures when not arranged according to the condyle path. A study of the condyle path will demonstrate that it is impossible for a commercial laboratory to construct a suitable artificial denture from the usual impression and bite. This means that the general practitioner must mount his case, try it in the mouth and know that it is right; then it is perfectly legitimate and honorable to send it to a mechanical man to complete the work, if you so desire. To such use of the commercial laboratory there can be no objection, but to consider that a dentist will send an impression and bite to a laboratory, hundreds of miles away, and expect in return an esthetic creation—well, it is an utter impossibility. The general practitioner is shirking his responsibility and imposing upon his patient by such procedure.

The upper picture on the right is a straight profile, which is indicated by an imaginary face line which would touch the chin, lips, middle of the wing of the nose and frontal eminence. Daniel Webster had a comparatively thin and compressed upper lip or he wore artificial dentures, which is doubtful.

The left lower portrait is of Cardinal Newman and shows a slightly concave profile. A straight line would touch the frontal eminence of the forehead and the mental eminence of the chin only, the middle of the wing of the nose and the lips would be distal to the line. This indicates that the middle third of the face is under-developed or that the forehead and chin are over-developed. We do not know, but the apparent depressed middle third of the face may have been due to neglected or inefficient dental services in childhood and youth. However, in constructing artificial dentures for such a mouth harmony would not be restored by placing the lips in relation to the perpendicular face line, as is required for a straight

profile. The convex profile is well illustrated in the remaining portrait. A casual student of physiognomy, after studying the intellectual forehead and firm chin of Cardinal Newman, might say that this receding forehead and chin represented a low mentality and weak character. Such a conclusion would be wholly wrong, for Henry Clay was every whit a peer of Webster and Newman. However, he is a fine example of a new type of profile now



Fig. 3

well established. In the days of the ancient Greek the straight profile was undoubtedly the profile of superior mentality, but today it must share its honors with the convex. There is some question whether the concave profile should be called a type, and I doubt the wisdom of using this almost classic straight profile as an illustration of a concave profile. To my mind a concave profile is always a deviation from normality.

In Fig. 3 we have other illustrations of the profile. You notice the beautiful, straight profile and the character behind it. See the three thirds of the face, the relation of the chin, lips, nose and forehead; we could hardly conceive that such a face as this should not have a grand character. We may not have seen the individual, yet I think we can all imagine that

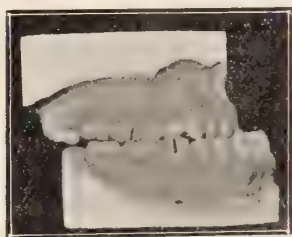


Fig. 4a



Fig. 4b

there is real nobility, and we are not surprised that Chicago is proud of its Jane Addams. This convex profile is not a weak face, it is typical of a race and the face of a lady of character and of considerable reputation as a lawyer. This concave profile is a drawing by Lavater to illustrate a hypochondriac. In this case the middle third of the face is thoroughly depressed. We may be thankful that few such cases are presented to us in practice. Fig. 4 is a dentist whom many of us know and admire. Dr.



Angle says this is the most extensive case of third class malocclusion, where all the teeth are intact, that he has seen. It is a fine illustration of a concave profile, but not a type; it is one of Nature's perverted straight profiles.



Fig. 5

Figures 5 and 6 illustrate the four basal temperaments. Dr. Jacques, the author of an excellent work on "Temperaments," defines temperaments as "A state of the body dependent upon certain combinations of the various systems and organs and certain functional conditions affecting them." He says further, that a temperament once established tends to perpetuate itself, but that it is not an unchangeable physiological condition, for by a radical change of habits of life, environment, etc., an entire change of the so-called temperament may be brought about. We cannot change the color of our hair and eyes, by legitimate means, at will; but we can so alter our being that we will belong to a different temperamental classification. The faces in Figs. 5 and 6 are named in order: 1 and 2, two types of the Lymphatic

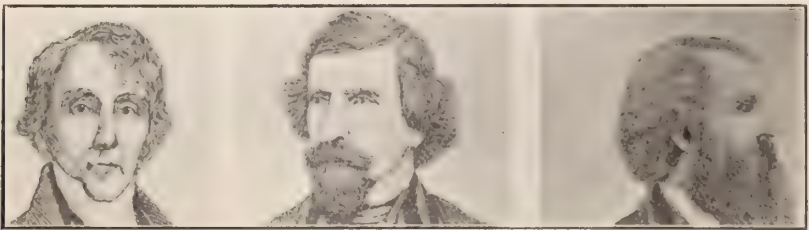


Fig. 6

temperament; 3, Nervous temperament; 4, Bilious temperament, and 5, Sanguine temperament. Much valuable knowledge of what constitutes harmony of the features of the face may be obtained by the temperamental classification. However, I am of the opinion that some writers have placed too much stress upon temperaments in constructing artificial dentures, but we cannot discuss this phase of the subject at this time.

Thus we may assume that to understand the esthetics of prosthesis one must have a fair knowledge of the anatomy and mechanics of the hard and soft tissues of the face, a more or less intimate acquaintance with the features of the face both at rest and in action. The features of the face at rest can be comprehended by observing, measuring and comparing them in profile. Much valuable knowledge may be obtained by studying the classi-

fication called "Temperaments." The pseudo-sciences of physiognomy and phrenology understandingly studied will be of much assistance in determining the value of the features in action. However, in reading books upon these subjects the dental student must keep constantly in mind that the quest of his investigation is esthetics of prosthesis and not the fanciful theories for which the books were designed to promulgate.

The remainder of our lecture will be confined to some practical applications of the principles that have been but imperfectly considered.

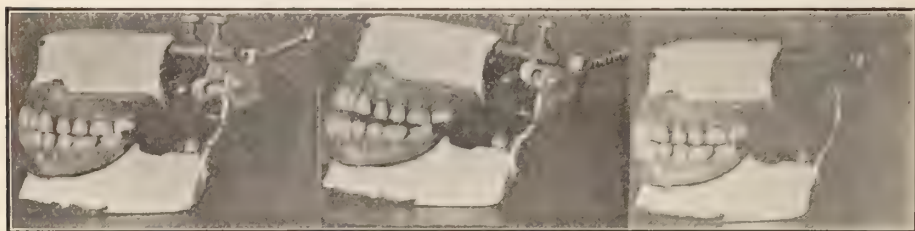


Fig. 7

Fig. 8

Fig. 9

Figs. 7, 8 and 9 show the importance of measuring the condyle path and mounting the case upon the antagonist with the "face-bow." They were referred to while considering the condyle path of the skull shown in Fig. 2. Fig. 7 represents a case mounted upon the New Century antagonist having the condyle path placed in a medium oblique position, the teeth mounted normal and placed in incisal occlusion; showing the so-called "three-point contact." Fig. 8 shows the condyle path of the antagonist changed to the horizontal position and an attempt made to place the teeth in incisal occlusion; and Fig. 9 shows the condyle paths changed to a nearly perpendicular position and the teeth plane in incisal occlusion. These three illustrations demonstrate the necessity for the use of the face bow and obtaining the direction of the condyle path. Fig. 7 demonstrates that the dentures, properly constructed, will be balanced in every position; Fig. 8 that incisal occlusion is impossible, and Fig. 9 that pressure upon the teeth in incisal occlusion will instantly dislodge them.



Figs. 10

11

12

Figs. 10 and 11 show a very well-proportioned face. It has a straight profile with thin lips, inclined to be compressed. Imagine the result if the teeth were so mounted as to protrude the tuberculum of the lip in an attempt to represent a thick, rosy lip, and in connection with the protrusion

the naso-bucco-labial triangles are left unrestored. Would it not suggest the beak of a bird? Figs. 10 and 11 show the harmonious contour of the lower third of the face at rest, and Fig. 12 shows the ease and grace of the mouth while laughing.

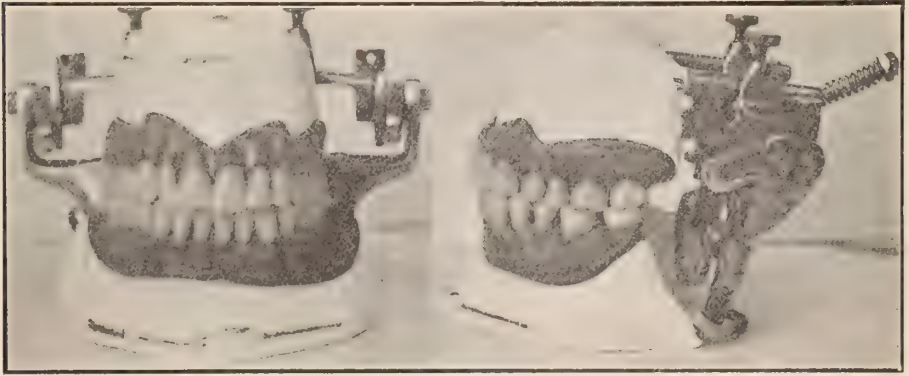


Fig. 13

Fig. 14



Fig. 15

Figs. 13 and 14 show the contour of the dentures necessary for such a restoration. Fig. 15 shows the lingual aspect of the dentures. The restoration of the lingual contour of the teeth and rugae are more than fanciful, they are utilitarian.



Fig. 16

Fig. 17

Figure 16 presents two views of an edentulous patient. The middle third of the face is short, which is indicated by comparing the nose with



the ear and the lower third of the face. Profile straight, and the sanguine temperament predominating.

Figure 17 presents, upon the left, the lower third of the face improperly restored, and, upon the right, a correct restoration.

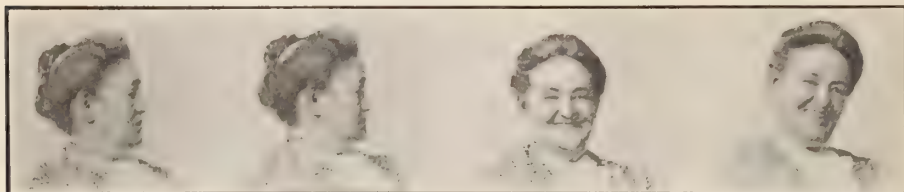


Fig. 18

Fig. 19

Figure 18 shows two profile views, the left correct and the right incorrect.

Figure 19 contains two studies of the face in action. In the one upon the left the lower teeth are out of sight, and the upper ones undersize gum section teeth. In the study upon the right the lower teeth are slightly in evidence; but the gum portion of the upper denture does not show even in the extreme elevation of the lip. If the teeth are of proper size, form, color, suitably aged and gracefully set the harmony must be complete.

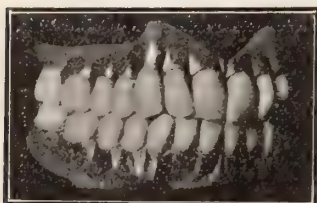


Fig. 20

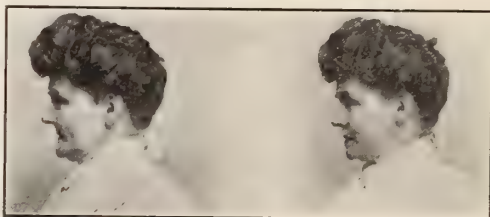


Fig. 21

Figure 20 shows the artificial dentures used for the properly restored features in the preceding three figures. Notice the rounded contour of the teeth, both in form and arrangement, indicative of the sanguine temperament; aged condition as shown by the slight grinding of the incisal edges



Fig. 22



Fig. 23

and the receding upper gum; the gum contour as shown by the depressed incisal fossae, restored cuspid eminences and minimum buccal restoration; and the arrangement of the bicuspids and molars, indicated by the inter-cuspalting of the cusps, also the straight line of the cusps of the cuspid, bicuspids and first molar.

Figures 21, 22 and 23 present a study of a much more extensive restoration.



Fig. 24

Fig. 25



Fig. 26

Three views of an extreme case of arrangement and contour.

### REMOVING BROKEN CROWN POSTS.\*

By Dr. C. Clifford Stone, Romeo, Mich.

Take S. S. White trephine No. 253, trephine around the post into end of root to sufficient depth. Take an ordinary screw mandrel and reduce the shoulder on the lathe to diameter of the shank, shorten the mandrel to one-half inch and flatten the sides, so that it can be grasped with the pliers, which gives a small steel mandrel which, forced over the post, will cut a thread as it goes down. Screw it down firmly, and grasping the mandrel with the post puller, remove the broken post.

\*Clinic at Michigan State Dental Society, 1912.

## THE VALUE OF THE MARGINAL RIDGE IN PROXIMAL FILLINGS.\*

By Russell W. Bunting, D.D.S., Ann Arbor, Mich.

THE PROBLEM of Oral Hygiene is practically determined by the amount of foodstuffs that habitually remain in the mouth. In some mouths the food is finely divided and is washed into the digestive tract, little remaining about the teeth. In other mouths the foods are retained in relatively large quantities, packed in and about the teeth. In the former case the condition would be one of good hygiene, while in the latter the converse would be true.

The amount of food which is retained in the mouth is determined by several forces. It will depend upon the kind of food ingested. Those which are hard and brittle mechanically scour the teeth and do not tend to remain in the mouth, while the soft, starchy foods stick to the teeth very readily and are prone to be retained.

The viscosity of the saliva, the manner and strength of mastication and the arrangement of the teeth all have their part in the determination of the oral hygiene, but I wish to call your attention especially to the factor of tooth form in this regard. We must all agree that a normal set of teeth, arranged in good occlusion and properly used, is usually self-cleaning. Such a set of teeth will so finely and thoroughly divide the food, and will offer so few retention spaces, that the bulk of the food will be washed out of the mouth and the teeth will be left clean. If by the wear of mastication, the destruction of caries or the improper insertion of a filling the tooth loses its full form and contour, then does that mouth cease to be self-cleansing and a poor hygiene is induced.

The favorite site for retention of foods is that of the interproximal space. When the teeth which form that space meet in a sharp, definite contact by reason of full contours on their approximal spaces, the food which is forced in will be held back or divided so that a portion will go to the lingual and a portion to the labial. This will be true if food does not pack into this space in too large pieces, or too great quantities. In the normal occlusion this amount is determined by the approximal ridge of each tooth. These ridges, if sharp and well formed, offer an elevation upon which the food may be cut by the antagonizing teeth. The food thus cut by each marginal ridge will then remain upon the grinding surface of the molars and bicuspsids to be further ground by mastication, while but a small portion remains between approximal ridges to be carried down through the approximal space. Thus the proximal space is normally protected from being overcrowded with foodstuffs. If, however, the mesial or distal occlusal of a molar or bicuspid is flat, having no marginal ridge, due either

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\*Given as a clinic at Northern Ohio Dental Society, 1912.



to attrition or to faulty restoration of tooth by filling, in either case, an excess of food will be crowded into the proximal space and lodgment will be favored.

Due to the teachings of Black and many others, the dental profession has learned the importance of the "point contact," and every conscientious operator is producing such contours on his approximal fillings that the proper point contact is restored. But too often do we see that such fillings, beautifully executed as to their lateral contours, are made perfectly flat on the occlusal surface in bicuspid and molars, rendering them incapable of cutting food of any kind and limiting their action to that of crushing. Such fillings are lessened in their efficiency for mastication and favor the retention of foodstuffs in the approximal spaces.



The accompanying illustrations are enlarged plaster models of two fairly normal teeth, a molar and a bicuspid. Upon each has been painted a surface of gold paint to simulate a gold filling and to call attention to the fact that such a gold filling, if it restores the tooth form, will have a high marginal ridge. Such ridges are to the teeth as are the ridges on the board of a washerwoman; without the ridges the board is useless, without the approximal ridges the teeth are impaired in function.

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### CAST CUSP CROWN.\*

By C. E. White, Indianapolis, Ind.

Prepare root in proper manner, cut a piece of 22-k. gold large enough to make the band, wide enough to include cusps, fit the band to root and trim to occlusion. Contour the band with pliers to form the cusps. Place warm inlay wax, or better still, Alexander's gold, inside the band, condense same or trim and carve (if wax) to occlusion. If wax, invest and cast; if Alexander's gold, place solder on cusp of crown, place over Bunsen burner, burn out wax and sweat solder in the gold. Polish the crown and cement it on at the same sitting.

\*Given as a clinic at Indiana State Dental Society, 1912.

## NITROUS OXIDE AND OXYGEN ANESTHESIA\*

By Dr. Val H. Frederich, St. Louis, Mo.

**I**N PRESENTING this paper tonight I shall endeavor to be as practical as possible, eliminating or touching but lightly upon certain phases that might be considered immaterial.

## HISTORICAL

Nitrous oxide was discovered by Priestley in 1772 or 1774, but was of no practical use until brought out by a Mr. Colton in 1844. Mr. Colton was an itinerant chemist and was giving exhibitions and lectures on chemistry. At one of these performances was present Horace Wells, a dentist of Hartford, Conn., who noticed that one of the individuals who had inhaled a sample of nitrous oxide injured himself without feeling any pain. Subsequently, at the request of Wells, Mr. Colton administered the gas to him and during the momentary unconsciousness a Mr. Riggs, another dentist, extracted a molar tooth from Wells' jaw.

Wells was much elated and cried out, "A new era in tooth-pulling. It did not hurt me as much as the prick of a pin. It is the greatest discovery ever made."

Subsequently Wells attempted to give a public demonstration at the Boston General Hospital, which proved a complete failure. The patients were not completely anesthetized and gave unmistakable signs of having pain. This failure on the part of Wells led him to commit suicide and was also the cause of putting nitrous oxide into obscurity until it was again revived by Colton in 1863. Later on some English and German scientists made some scientific investigations which eventually led to the adoption of nitrous oxide for short operations. It is said that as early as 1867 Colton was able to give a record of 20,000 successful cases.

From that time to the present nitrous oxide has been the subject of much experimentation. At first, administered pure, it was later mixed with various percentages of air, which method was found wanting, and today it is being administered with certain amounts of pure oxygen. The appliances used for administering have also been wonderfully improved, from time to time, so that at present it seems no further improvement is possible or even desired. Other agents, too, such as morphine, scopolamine, ether, etc., are being used in connection with nitrous oxide, so that today we have in it an agent which threatens to supersede all other anesthetics, both for short and long operations in minor or major surgery. Such is fate, that the man who first discovered the anesthetic properties of nitrous oxide and sought to demonstrate it was driven to suicide by the jests of

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\*Read before the St. Louis Society of Dental Science, 1912.

the wise ones of his time, while today men at the top of medicine and surgery are lauding it to the skies and are advocating its use.

#### OLDER METHOD OF USING NITROUS OXIDE

To the dentist nitrous oxide and oxygen should appeal in a two-fold manner; as an anesthetic in the extraction of teeth, lancing of abscesses, etc., and as an analgesic in the preparation of cavities in sensitive teeth.

The old method of using nitrous oxide for extraction was to use the face inhaler (covering mouth and nose) and let the patient breathe pure nitrous oxide to the point of saturation or until complete surgical anesthesia was obtained. I am using the term "saturation" here to indicate the particular time when the patients had inhaled as much nitrous oxide as one would dare to give them and still preserve their lives. For to quote Hewitt, using pure nitrous oxide, "It takes on an average of fifty-six seconds to produce surgical anesthesia," and he also says, "Dangerous asphyxia is developed in fifty-six seconds." There is practically no latitude offered by pure nitrous oxide between surgical anesthesia and death. This method is still being used today, and by some very able men at that—men who have in the past and are now making a success of the extraction specialty. Still I am firmly convinced that if these men would use nitrous oxide and oxygen and thus prolong their anesthesia, their ability and consequently their results would be wonderfully enhanced. In my mind there is only one advantage in this older method of straight nitrous oxide, and that is the matter of cost. It is decidedly cheaper to administer nitrous oxide alone than in combination with oxygen, but this advantage should really not be considered. The average available anesthesia, using pure nitrous oxide, is but thirty seconds, and it is for this reason that this method tends to rapid extractors. However, here as in anything else, haste makes waste, and surely there is something besides speed to be desired in extracting teeth. Extracting at best is at times highly difficult, and only too often does one fall short of results that are desired.

#### NEWER METHODS OF NITROUS OXIDE AND OXYGEN

##### NASAL AND FACE INHALER

The newer method of using nitrous oxide is to use it in connection with pure oxygen. For operations upon the body the face inhaler is used, while for operations in the mouth, nose or throat the nasal inhaler or mouth tube is used. DeFord says, "If there is anything more difficult to handle than nitrous oxide it is nitrous oxide and oxygen." The same can be said of the two types of inhalers, the face inhaler and the nasal inhaler. Anesthesia, using the nasal inhaler, is much more difficult than with the face inhaler. The reason is that with the face inhaler, the relative proportion of the two gases can be more easily controlled than with the nasal inhaler, and atmospheric air can be totally excluded. There is also a device on the Teter face inhaler that makes it possible to use an intra-thoracic pressure, which can be regulated at will to suit any case. This intra-thoracic pressure



is of great importance. It causes the blood to take up more of the anesthetic and gives a deeper anesthesia. And again, with the face inhaler the breathing is absolutely natural and unhampered, while with the nasal inhaler there is always some interference by the tongue and also some slight inconvenience to the throat caused by the pressure employed. Then, too, with the nasal inhaler it is quite impossible to exclude all atmospheric air. A little will gain entrance to the mouth, and air is a disturbing element in nitrous oxide anesthesia. For these reasons, it is not always possible to get an anesthesia as beautiful and sleep-like with the nasal inhaler as it is with the face inhaler. However, with plenty experience one should be able to get a highly satisfactory anesthesia with the nasal inhaler and one that can be prolonged to any reasonable extent. Dr. Teter of Cleveland has a record of 4 hours and 20 minutes continuous anesthesia employing the face inhaler, and I see no basic reason why this cannot be accomplished with the nasal method, yet I have never heard of anyone employing the nasal inhaler for such a length of time. Nor would it be at all necessary, as most any operation in the mouth could be completed in fifteen or twenty minutes, or possibly half an hour.

#### WARM GASES AND BREATHING

An item of great importance is the warming of the anesthetic vapors. Warm nitrous oxide will give a much deeper and quieter narcosis than if it is cold. To again quote Dr. DeFord: "I have administered nitrous oxide cold for twenty-three years and nitrous oxide warm for three years, and I have not the language at my command to tell you how pleased I am with warm nitrous oxide." Dr. J. T. Gwathmey of New York has shown by experimental demonstration that all anesthetic vapors are safer when they are administered warm. A shorter time and less nitrous oxide is required when the gas is heated. In addition to this it is certainly more soothing to the bronchi and lungs when inhaled at blood temperature than if inhaled at almost a freezing temperature. If nitrous oxide is drawn from a small cylinder for any length of time the cylinder will actually be covered with frost. This is due to the rapid evaporation of the nitrous oxide in passing from the liquid to the gaseous form. A better plan is to draw the nitrous oxide from a large gasometer. The advantage here would be that the gas is not in the liquid state but in its natural form and at room temperature. The Teter apparatus which I use has an attachment for continuously heating the anesthetic vapors to almost boiling point, so that after passing through two or three feet of rubber tubing it will have cooled off to about blood temperature at the inhaler. Dr. Teter reports an actual improvement in the condition of several patients suffering from pneumonia, due, he thinks, to the warm gases inhaled.

Re-breathing is employed because it reduces the cost of maintaining a long narcosis. Nothing is gained except in the matter of expense. Nitrous oxide is not changed chemically in the body, so re-breathing does not affect

it. Care must be taken, however, to let in enough fresh nitrous oxide and oxygen to prevent an excessive amount of carbon dioxide. Each person is a law unto himself and one must be governed accordingly. Some will tolerate a large amount of carbon dioxide and others will not. Too much carbon dioxide will result in cessation of respiration. These two items—warm gases and re-breathing—make it possible to maintain an hour's anesthesia with about 150 gal. nitrous oxide and 40 gal. oxygen. Dr. Teter says it requires about 250 gal. nitrous oxide and 40 gal. oxygen if administered cold. Thus an hour's anesthesia would cost about ninety cents for the nitrous oxide and sixty cents for the oxygen, or one dollar and a half using the face inhaler. I do not know exactly what it would cost with the nasal inhaler, but think it would be about from two to four times this amount, due to the pressure employed and the consequent loss of gas escaping through the open mouth.

#### THE APPARATUS

An even and constant flow of the gases is necessary to secure the best results. I know of only two methods by which this can be successfully attained. The first is to use the large cylinders of nitrous oxide and the second is to make and condense the nitrous oxide yourself and either make or buy the oxygen in large cylinders. Nitrous oxide can be made for about sixty cents per hundred, while in the large cylinders it will cost about one dollar and a half delivered. It is obvious, therefore, which method is to be preferred. In either case the Teter apparatus is to be used, as it is beyond question the best machine on the market today. With this apparatus it is possible to administer nitrous oxide, oxygen, ether or chloroform, alone or in combination, warm or cold. It is also possible with this apparatus to use large or small cylinders, or you can lead directly into the machine with gases made yourself. Right here I would like to say no one should attempt to prolong the anesthesia with the nasal inhaler, using the small cylinders, because while it can be done it is very expensive and highly difficult to maintain an even pressure. And let me reiterate that an even and constant pressure is most important.

#### ANALGESIA

Another feature of this anesthetic is the analgesia it produces in the so-called first stage. During this condition the painful phases of operative dentistry can be at least mitigated if not entirely eliminated. This is a process that should be used more by the general practitioners than it is. It is my opinion that the man in general practice can get better results in his own office than he can by taking them to the specialist. The reason seems very plain. The psychic influence one may have over his patients is here a vast asset. The psychic influence may amount to no more than confidence on part of the patient. Take this same patient to the specialist and the confidence becomes suspicion and fear, which must be overcome before any good results can be realized. The important feature of the

technique for producing this analgesia is to not give your patient too much nitrous oxide but plenty of air and oxygen. The danger is always in giving too much nitrous oxide and taking your patient to the second or excitable stage. The air valve on the nasal inhaler must be opened and in addition enough oxygen must be constantly flowing in to prevent going too deep. Very little nitrous oxide is required. There is absolutely no danger connected with this operation, and it may be continued for any length of time. The patient will experience an agreeable feeling much like intoxication accompanied by a numbness and should be perfectly conscious. The activities of the brain are increased and the patient may talk in an incoherent manner. However, when these symptoms become too pronounced it indicates too much nitrous oxide and that the patient is passing to the second stage. While operating on the teeth in this condition one should always employ sharp burs and cut with a firm and steady hand. I have made several attempts to use analgesia for the surgical treatment of chronic alveolar abscesses (apico-ectomies), but have met with poor results. The analgesic stage is not deep enough for this class of work. Analgesia should be used only for cavity preparation (especially hyper-sensitive teeth), gum retraction, fitting of bands and like operations.

#### SURGERY

Nitrous oxide and oxygen should appeal in a most interesting manner to the medical fraternity for both minor and major surgery. It is little used, comparatively, in the western states, but in some of the eastern cities it enjoys a marked popularity. Many of the foremost men in surgery today give it their unqualified endorsement. Dr. George W. Crile of Cleveland has made extensive clinical and laboratory experiments. He has found that an overdose of nitrous oxide causes death by a combination of asphyxia and cardio-inhibition. Some authorities claim that death is caused primarily by asphyxia or paralysis of the respiration and that the heart will continue to beat for a long time after the respiration has ceased. This being true, there ought never be any deaths, for asphyxia is easy enough to prevent. There is at times not enough relaxation, and for this reason small amounts of ether are given in combination. Teter reports that about 10 per cent of his patients require the additional aid of ether to obtain complete relaxation. Another favorite method of Dr. Teter is to give hypodermic injections of morphine and atropine one-half hour before operating. He reports that in this manner 98 per cent of his patients can be beautifully anesthetized, accompanied by almost complete relaxation even for rectal and like surgery. The hypodermic injection of morphine and atropine makes it possible to give more oxygen, producing a beautiful sleep-like anesthesia entirely devoid of any cyanosis. Dr. Crile reports that the patients come out of the anesthetic almost immediately, quite regardless of the duration of the anesthesia. He reports that there is no post-anesthetic effect upon lungs or kidney, nor indeed upon any



other part of the body. That animals under nitrous oxide endure shock better than under ether. That handicapped animals, i. e., animals reduced by infections, hemorrhage or hyperthyroidism showed a marked advantage under nitrous oxide to those under ether. Also that the change in the ganglion cells of the central nervous system from the cortex to the cord, as indicated by the newer pathologic cytologic method, showed a distinct advantage in the nitrous oxide dogs over the ether dogs. That nausea in nitrous oxide cases in which there is no other nausea-producing factor rarely occurs. That only a great emergency would now induce him to use ether instead of nitrous oxide in grave infections. That in a parallel series of acute infections, consisting of seventy-five cases operated under nitrous oxide and seventy-five cases under ether, the pulse of the nitrous oxide patients showed an average decrease of ten beats, while the pulse of the ether patient showed an average increase of eight beats taken before the operation and during the first twenty-four hours following. That not a case showed the rapid march to fatality immediately following the operation under nitrous oxide as occasionally follows under ether. With such an array of facts and recommendations coming from an undisputed source, it is difficult to understand why this anesthetic is not more generally used in all of the hospitals.

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### A SIMPLE PREVENTIVE TREATMENT OF SYNCOPE.

By C. M. MacKenzie, D.M.D., Sprague, Wash.

Former Oral Surgeon to the Boston Emergency and General Hospital, Boston, Mass.

THE DENTIST perhaps more than the physician is called upon to treat this condition, it being of frequent occurrence in the dental office, particularly among those paying a visit to the dentist for the first time. A large number of this class are filled with fear, in many cases approaching the intensity of horror; consequently we have all noted the fact that fainting is rarely the result of intense pain inflicted in the dental chair but rather the climax following a severe emotional strain, causing, in most cases, a temporary vasor motor paralysis.

The premonitory symptoms, such as modified circulation, pallor of the skin, coldness of the extremities, cold perspiration, changed or lost expression of the face and superficial respiration, should not be disregarded, for the early recognition of these is essential for effective preventive treatment. The writer has, both in hospital and private practice, resorted to various means to stimulate the vaso-motor, cardiac and respiratory centers in an effort to prevent total loss of consciousness, but the one offering the greatest success is the following, and I therefore recommend it to the profession as a simple and effective treatment.

During the earliest manifestation of these symptoms I immediately tip my chair backward, placing the patient in a recumbent position. I

next pour a little pure alcohol into my hand and, by giving it a quick throw, spray its contents directly upon the face of the patient. This is followed by a gentle breeze from my electric fan, giving the patient a most refreshing sensation. The above procedure may be repeated two or three times if necessary—once, however, will usually bring about the desired reaction.

In throwing the alcohol in this way a few drops usually finds its way into the eyes. This organ being so highly innervated naturally causes the alcohol to act as a powerful irritant, consequently we get an efficient stimulus, the influence of which affects the optic, motor oculi, trochlear, trifacial, abducent and facial nerves. The physiological explanation for the efficiency of this treatment lies in the relation of these various nerves to the vaso motor, respiratory and sympathetic centers.

For instance, the afferent fibers of the cervical sympathetic which are stimulated in this way excite the vaso motor center in the medulla, causing a contraction of the general arterial system, thereby increasing the blood pressure and preventing loss of consciousness, while the respiratory center is influenced by the exciting fibers in the optic and cutaneous nerves.

The irritating effects of the alcohol upon the eye is usually offset by the profuse flow of lachrymal fluid immediately following its introduction.

## IODOGLYCEROLE IN THE TREATMENT OF MOUTH INFECTIONS.\*

By Eugene S. Talbot, M.D., Chicago, Ill.

**N**O ONE DRUG has come into general use as a germicide with such universal satisfaction as iodine. Its virtues are so well known in surgery as to require no comment.

I began the use of this drug in 1878 when I commenced my researches in interstitial gingivitis. As a mouth antiseptic and germicide it acts more quickly and more satisfactorily than any other drug. The objection to the use of the official preparation, which contains 7 per cent iodine dissolved in alcohol to which is added 5 per cent potassium iodide, is due to the fact that frequent applications will destroy the mucous membrane of the mouth. To obviate this, I prepared the following and called it iodoglycerole:

Water .....	2 parts	Iodine (crystals) .....	5 parts
Zinc iodide .....	3 parts	Glycerin .....	10 parts

As compared with the ordinary tincture of iodine, its astringent properties are greatly increased; the glycerin causes rapid absorption and the irritating effects are reduced to a minimum. The penetrating effect is remarkable. The glycerin thickens the preparation and prevents it from

\*Read before the Section on Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession, by special arrangement with the Jour. Amer. Med. Asso.

mixing with the saliva and running over the mouth as the ordinary tincture will do. This preparation may be used on the gums every day, if necessary, without injuring the parts. The teeth as well as the soft parts of the mouth should be treated in like manner since all germs are destroyed. I have been able to reduce decay of the teeth in my patients in the past ten years from 30 to 40 per cent. All patients receive this treatment before or after each sitting.

Patients present themselves with fetor of the breath, pus about the teeth, inflamed gums, diseased alveolar processes, acid mucus and saliva, the latter being also ropy and stringy, plaques on the teeth and decay, with all forms of bacteria from the most harmless to the more dangerous pathogenic microorganisms such as the pneumococcus, diphtheria bacillus, tubercle bacillus and the germs of children's diseases. Miller has demonstrated more than fifty varieties of microorganisms in the mouth. Pus germs are often present in and about the necks of the teeth, and easily infect wounds and inflamed tissue. These germs are also taken into the stomach at every swallow; some pass through into the intestines and have been found in the feces. While most of the better class of patients possess fairly cleanly mouths, yet from 12 to 20 per cent of all patients have pus germs in the oral cavity.

Tooth decay is due to lactic-acid ferment and nearly every person has it to a greater or less extent. Clinic and dispensary patients and especially the poorer classes, who never use brushes, washes or powders in the mouth, possess regular cesspools of filth.

To prevent contagions and infections among public school children, their teeth, gums and mucous membrane should be treated with iodoglycerole as often as once a week during the school term.

What I wish particularly to call attention to is the wonderful effect this preparation has on bone disease, such as caries, necrosis, osteomyelitis and all pus surfaces such as ulcers, carbuncles, boils, etc. When applied to the bone tissue it does not corrode and coagulate, but penetrates into the tissue, reaching the remote recesses of the cavity, and destroys the pus and other germs with which it comes in contact.

Caries of the alveolar process due to abscessed teeth yields readily after the root or roots have been amputated, often without curettement of the bone. The soothing effect of the glycerin, the astringent and stimulating properties of the zinc iodid, and the germicide and antiseptic qualities of the iodin all help to restore bone tissue quickly to health.

In all operations on abscessed cavities it should be used before as well as after operations; in extracting teeth, with or without abscess formation, it should be used before as well as after; in inflamed and diseased tonsils in which germs are always present, the preparation may be used with splendid results.



Care should be taken in compounding this formula to see that the druggist uses the pure zinc iodid.

31 North State Street.

#### DISCUSSION

DR. M. H. FLETCHER, Cincinnati: I have had good results from this preparation. I have attributed its value to the iodine it contains, but I can see from the explanation where the by-products are of value.

DR. M. I. SCHAMBERG, New York: I have used iodine in the mouth for a number of years, and recently I desired stronger solutions than those provided, but without the destructive influence of the pharmaceutical preparation on the mucous membrane. I was finally able to get a scientific chemist to make for me a 15 per cent solution in some oil. This preparation has worked beautifully in the putrefactive conditions about the mouth and in pyorrheal pockets. Surgeons generally are adopting the use of iodine more freely than ever before, so they frequently bathe wounds with iodine preparations instead of with mercuric chlorid solution.

DR. VIDA A. LATHAM, Chicago: In the operating room, as you all know, they have a standard preparation, and the nurse hands you the bottle for use, whether it is for a laparotomy or a tuberculous incision in the neck. What is the result? I had a most disagreeable case to handle not long ago, a boy with tuberculous glands to be removed. I had more trouble from the burning and sloughing of the skin and epidermis due to the solution than I had from the operation. Why? Because the alcohol tincture in the heat of the operating room becomes concentrated, and as a consequence there is danger of burning the skin.

DR. S. L. MCCURDY, Pittsburgh: In the first edition of my work on oral surgery, published in 1902, I recommended the use of iodine. I had been using it a good many years before that time in general surgery, and before the American Orthopedic Association, seven or eight years ago, I read a paper on the use of iodine in long-bone infections in which I reported a series of cases of osteomyelitis of long bones in which iodine was used and in which it was generally satisfactory.

I have never had a symptom of poisoning when injecting it into old tuberculous sinuses, as Dr. Beck recommends his paste. In injecting it into these cavities I have a needle, specially made for this work, six inches in length, so that the bottom of the cavity may be reached.

I think the glycerin adds very much to the efficiency of the preparation. The muds made of a combination of kalolin and glycerin have a hygroscopic power which is in the glycerin and not in the mud. I have become so convinced of the value of glycerin in this connection that I now use in all bone diseases and in inflammatory conditions about the glands of the neck iodine, 1 part, and glycerin, 7 parts, applied on cotton.

DR. EUGENE S. TALBOT, Chicago: Some German a few years ago found that it was necessary to use only about 10 or 12 per cent of the ordinary tincture of iodine to destroy these germs after surgical operations.

It is absurd for us as practitioners of stomatology to place our hands in filthy mouths without first sterilizing them. If you go into any dental college you will find clinics given by students who never undertake to use an antiseptic at all, but operate with pus oozing from around the gums, and in filthy mouths in which no attempt has been made to sterilize. I frequently send patients home after making an application of iodine, and have them come back once or twice for additional applications until I find the mouth in a normal condition, before I undertake to treat them at all. And every patient that comes to me gets an application of that preparation either before or after operation. A little cotton wound on the end of an applicator can be carried in the mouth and around the necks of the teeth. You need not be so particular as to how much of the iodine goes over the teeth and gums, if it is the first application in a filthy

mouth. I apply it quickly before it is absorbed and before it gets all over the tongue, cheek and lips. In those other patients I am more particular about carrying it around the margins, to hold the lips apart until it dries out.

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## INFECTED AREAS AROUND THE ENDS OF ROOTS OF TEETH.\*

By M. L. Rhein, M.D., D.D.S., New York.

Lecturer on Dental Pathology, Department of Dentistry, University of Pennsylvania.

THE spongy character of the alveoli in which the ends of the roots of the teeth are embedded leaves them especially vulnerable to purulent invasion. This portion of the alveolus is frequently referred to as the apical space, because so often the osseous structure around the apices of the roots is lost to a greater or less extent on account of an abscess forming in this region. The majority of these infections are alveolar abscesses arising from the death of the pulps of the teeth. There are also pericemental abscesses, existing coincident with living pulps which have not been infected. This latter class may be variously subdivided.

The course of the ordinary alveolar abscess is generally marked by a crisis, at which time the pus escapes into the mouth, either through the plate of the alveolus, or between the periosteum and the root at the gingival border. Unless a radical cure of the abscess is effected a permanent fistulous opening remains, through which afterward a more or less constant flow of pus is discharged into the oral cavity, mixed with the normal fluid and swallowed. This form of abscess is readily diagnosed by reason of the apparent clinical factors, and whatever consequent pathologic lesions result are due to neglect in permitting such an infection to remain *in situ*.

There is, however, another form known as a blind abscess, in which a granulomatous defense seems to arise, causing a fibrous encystment of the abscessed area. In this case there is no fistula affording an outlet into the mouth. The only symptom is an occasional tenderness over the region of the diseased area, and only too often even this symptom is lacking in bringing attention to the point of infection. Generally this area increases in size and often causes discomfort for the first time after five or ten years of steady encroachment on the contiguous surfaces. This form of abscess is much more dangerous to the individual, because its presence is not suspected although pathogenic conditions may be taking place in various parts of the body as a result of the absorption of these toxins. Although there remains a great amount of work for the bacteriologist in this disease, it is evident that the various forms of streptococci play the predominating rôle in the same manner that they do in cryptic infections of the tonsils.

The toxemia resulting from these blind abscesses is of such a slow and insidious nature that generally great harm has been done before their pres-

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\*Read before the Section on Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession, by special arrangement with the Jour. Amer. Med. Asso.

ence is suspected. They are a result of a traumatism, some disease of the pulp, or imperfect pulp removal by a dentist. In the last few years the radiograph has demonstrated how few mouths are free from blind abscesses. Gilmer, of Chicago, estimates that 25 per cent of the people have infected areas around the ends of the roots of their teeth.

The absorption of pus in this manner produces the same results that pus absorption can produce in any other part of the body. Our literature teems with clinical notes of these cases. I could add many such data dealing with all such conditions, but it is not intended in this presentation to do more than give a synopsis of the factors involved.

In dermatology, the various acnes, eczemas, herpes, erythemas, urticaria, edema, alopecia, seborrhea, psoriasis, erysipelas, etc., can have such an etiologic factor, or their conditions can be complicated by the presence of such septic foci: affections of the upper respiratory tracts, the eye and the ear have all been traced to the same source.

Endocarditis and all the allied joint affections frequently owe their inception to a blind abscess. Pernicious anemia has been traced to this source by many authorities. Diseases of the nervous system, even to the production of insanity, have too frequently been cured by the removal of these septic foci to leave any doubt as to the possibility of their having such dental origin. In like manner clinical data as to nephritis, diabetes, cirrhosis of the liver, and many other diseases caused by infections could be cited to demonstrate the fact that in a correct diagnosis of such conditions the possibility of any dental infections should always be considered.

At the present day the radiograph gives us a clear picture of this field and makes a diagnosis comparatively easy, whereas formerly it was not only questionable, but also attended by innumerable obstacles. Superficial mouth examinations by physicians or by incompetent dentists have for many years been the main reason why so many etiologic facts of this nature have not been observed. The true physician cannot continue to salve his conscience by the farce of this kind of oral examination.

The failure of the medical curriculum to give proper stomatologic instruction to the student is primarily the reason why so many forms of malnutrition proceed to an incurable stage before they are even diagnosed. Is it not about time for the American Medical Association to use its power in urging the introduction of such a course in the college curriculum? Only after this shall have been accomplished on a broad and intelligent basis will this barrier to a more correct diagnosis be destroyed.

If it is true that 25 per cent of the people have such abscessed areas at the ends of the roots of the teeth, the fact certainly deserves some consideration. A careful investigation of the subject will show that this is not caused by negligence on the part of the people in caring for their teeth, but in most cases is directly traceable to imperfect dental work. If the tooth is to be conserved in a healthy state, after disease and death of the dental pulp, every portion of the organic material in the root canals must



be removed and these canals sealed with an impervious homogeneous filling. This operation must be conducted with thorough aseptic precautions so that when it is completed all possibility of future infection shall have been dissipated. The irregularity of many roots and the tortuous nature of some canals make this frequently a very difficult operation and in a small percentage of cases an impossibility. In such cases the infected portion of the root must either be removed or the tooth itself extracted. The imperfect education of dentists is the cause of some of these conditions, but not of the greater majority of them.

The proper removal of such pulp material and the subsequent aseptic sealing of the canal generally entails hours of the most painstaking labor. The average dental practitioner finds it impossible to obtain a living fee for the expenditure of the amount of time necessary in a given case. This has resulted in the practice of a hasty and partial removal of the pulp, and dependence on the insertion in the canals of disinfecting agents to guard against future infection. That such medication has but a temporary value is generally understood; but there is no one to criticize such work.

If any other specialist should leave a portion of necrotic tissue in the body, it would at once bring forth the strongest protest from the patient's regular physician. Nevertheless, dentists are daily performing such surgical operations and leaving portions of necrotic tissue buried in the alveoli to become the foci for future infections. The patient's physician not only interposes no objection, but likewise submits his own mouth to the same unsurgical procedure. This is no new statement of facts, but it seems that simple words are unavailing in arousing the profession to this continued unnecessary sacrifice of human life. Surely by this time some little impression should have been made on our confrères. The time must be near at hand when the profession will give this the attention it merits.

38 East Sixty-First Street.

#### DISCUSSION

DR. M. H. FLETCHER, Cincinnati: I have satisfactorily followed for twenty-five years the practice of putting a very small portion of arsenic, say 0.01 of a grain, as near the apex of these inaccessible roots as possible. It is inserted by winding a few shreds of cotton on the end of a broach and dipping it into the arsenious acid, and then putting it in a root filling. Most persons say this plan is dangerous, but they do not fully comprehend the technic. The whole object of filling the root canal is to keep it aseptic, but if it cannot be obliterated it can be kept aseptic for a life-time with a little arsenic, because arsenic is so slowly soluble. What little arsenic could get through the apex will easily be taken up by the blood-vessels without injury to the tissues in the apical space. If these spaces are sore from infection they will get progressively worse. Should they become sore from the use of arsenic (which they very rarely do) they will get progressively better. Infection continually increases. Arsenic prevents infection and is continually eliminated. Perfect obliteration of the root canal is the ideal way, but my inability to accomplish this in some cases leads me to endeavor to keep these spaces sterile.

DR. C. J. GRIEVES, Baltimore: For the past three years in Baltimore I have been associated with Dr. W. S. Baer of Johns Hopkins University in the study of these conditions, and we have accumulated over a hundred odd cases of this type of infection,

apical infection, as the primary portal of entry for infectious arthritis, and in a few cases we have been able to isolate absolutely the infecting microorganisms; that microorganism being *staphylococcus*, contrary to Dr. Rhein's statement—I mean in the type of cases in which we had blind apical abscesses. In almost every instance there had been some bad apical dentistry done—some portion of necrotic tissue left or some effort made to fill the root canal. The dentist had evidently done all that could be done under the circumstances; he was trying to do an impossible thing in the filling of a tortuous canal and to remove all the contents. Nevertheless, the result was a quiet abscess of which the patient took little or no cognizance, but which had run along for years.

Out of the hundred odd cases there were a few that were clearly straight infections from a tooth-root; general infections were the rule. There would be associated crypts in the tonsils, chronic appendicitis, etc., or some other condition that tended to render this condition possible. These cases were of long standing, with abnormal temperature that ran for months. Some simulated tuberculosis, but most of them were arthritides. The method of diagnosis has been almost entirely that of digital pressure high over the alveolar process. After the area was found a series of small radiographs was taken of not more than the roots of three teeth in any one picture. The only thing we could do to relieve the condition in many cases was extraction. In many fistula cases associated with arthritis (not blind abscesses), when the fistula healed, the temperature of the patient would go up, showing pressure absorption from retention of pus, and when the fistula was opened and drained, the temperature would become normal again. In these cases extraction almost invariably did the work when it was a clear case of the teeth as the primary point of infection.

The medical men with whom I have been associated regularly from the clinical observations condemn a tooth that has a crown on it, so thoroughly do they associate these pus conditions with the crowned tooth. Of course, we know as dentists that that is an injustice. They have, however, seen so many of these cases in which poor canal work has been done and the teeth crowned and which have later resulted in necrotic conditions in these areas that I regard them as justified in asking for radiographs of the tissues round the apical ends of the crowned teeth.

DR. M. I. SCHAMBERG, New York: While it may be true that Dr. Fletcher and other members of this Section are active in the instruction of students in medical schools, this practice is far from being general. There is no reason why the student should be ignorant of this subject any more than any other branch of the healing art, and, moreover, the men should be compelled to pass their examinations on this subject, just as they would on the eye, the ear, the nose, the throat and other parts of the body. I do not believe that it is necessary for our Section to enter into a matter which can be so readily discussed elsewhere. I believe that this Section should be active in trying to do something rather than trying to solve something.

DR. THOMAS L. GILMER, Chicago: The importance of good hygiene of the mouth cannot be overestimated. Oral pathology should be better taught in medical schools. In general pathology physicians are usually well informed, but deficient in oral pathology. I think it would be most damaging to let Dr. Fletcher's statement go unchallenged that it is good practice to put arsenic on cotton in the roots of teeth and depend on it as a permanent antiseptic.

Arsenic has no place in the teeth at all. It will not remain at the end of the roots indefinitely, as an antiseptic. If a medicament is soluble it will not permanently remain in the root; if it is insoluble it is not an antiseptic. The idea of utilizing antiseptics as permanent root filling is impracticable. The apical ends of some pulpless roots become encysted even if they are not well filled, and such roots will do no harm. Radiographs, on the other hand, show that in some instances well-filled roots have blind abscesses at their apices.

I believe that we extract too few teeth; we used to extract too many. We can, however, in some instances cure chronic alveolar abscesses, which are incurable by medi-

cation through root canals, by resection of the offending part of the root and curetting the walls of the abscess.

DR. S. L. MCCURDY, Pittsburgh: The word "infection" has been, I think, used very loosely in this connection. A cyst on the end of the root may become an open cyst, may become infected and become an abscess. When we talk about bacteria on the end of the root of the tooth, the question arises, How did the infection get there?

DR. E. S. TALBOT, Chicago: I do not believe that the profession today is aware of the number of peridental abscesses that there are in the mouth. These abscesses lie dormant for years. I had a tooth extracted two weeks ago with a blind abscess on it which I believe to have been in my mouth for fifty-two years. When a boy, 10 or 12 years old, I had a toothache, and a country doctor tried to remove that tooth with the old-fashioned turn-key. He failed to remove the tooth, but he stopped the pain, and from that time to this I have never had any pain in that tooth. This tooth was afterward crowned, and it has been of service to me ever since until I was obliged to have it removed.

I honestly believe that these abscesses are doing a great deal of damage. I believe that arthritis is the result, but at present we have no direct proof. We know that pus is distributed directly into the blood from these abscesses; we know also that pus is swallowed every time we take food into the mouth. Do pus germs pass through the stomach when hydrochloric acid is present? Of course, hydrochloric acid is present only with digestion of foods. It is possible that these germs can pass through when hydrochloric acid is not there. This has not been really demonstrated. No one has found pus germs in the stomach at the present time. One man has found pus germs in the feces in some ten or twelve examinations.

DR. M. L. RHEIN, New York: I agree with Dr. Gilmer's criticism of Dr. Fletcher's technic in treatment of root canals, the end of which it is impossible to reach. The theory needs to be supplemented by scientific facts; not clinical data, but proofs that infection is impossible. The fact that Dr. Fletcher has had splendid results from sealing an infinitesimal amount of arsenic in the end of the canal is, to my mind, no proof that subsequent infection will not take place. If Dr. Fletcher will have a large number of such teeth on which he has operated in years past radiographed it will give us an opportunity to make a reasonable scientific deduction as to the results.

I do not agree with Dr. McCurdy that it is a complicated point as to the source of infection in this area. There are only two methods by which infection of these areas can be obtained; either through the mouth arising from the defects in the technical work of sealing the root canals and absorption of bacteria, or through the circulation at the end of the root. I am convinced that such infections as we have commonly looked on as the worst, in which there was an open fistula from the abscess with the patient swallowing pus in large quantities, was not nearly so detrimental to the patient as the little blind abscess at the end of the root. There is no question but that certain secretions in the intestinal tract destroy a portion of the swallowed pus. A root canal may be imperfectly filled and go for many years without any infection. I question the statement Dr. Talbot made in reference to the tooth in his own mouth, that this blind abscess had been attached to that root for fifty-two years. It may be that this abscess only appeared within the past few years. I have examined root canals that I have filled years before we had the radiograph, in which I thought at the time that I had reached the ends of the roots, and have found that the filling did not go to the very end of the canal. The space we speak of as the apical space was, however, in an absolutely physiologic condition. When Dr. Gilmer speaks of improper dental work resulting in the death of many people, he has not exaggerated one iota. If pulp canal work is done it is essential that the aseptic filling material should go to the very end of the canal if we want to have absolute assurance that secondary infection through the circulation cannot take place.



## FUNDAMENTAL PRINCIPLES IN CROWN WORK\*

By F. H. Orton, D. D. S., St. Paul, Minn.

Professor of Crown and Bridge Work Dental Department, University of Minnesota.

THE TREND of modern dentistry has been unmistakably in the direction of an emphasis upon prophylaxis. Not in dentistry alone, but in the entire field of medicine it has become increasingly clear that no cure is really complete until it has included a prevention of the conditions which made that cure necessary. The establishment and maintenance of favorable conditions is the primary *duty* of the physician, and this is the meaning of prophylaxis as applied to the *oral cavity*.

One of the chief conditions revealed by clinical experience, as presenting the possibility of favorable as well as unfavorable variations, is the shape of the teeth themselves. An *unfavorable* or *abnormal form* of the tooth may be a predisposing factor in caries and gingivitis. An equally important factor is the relative position of the tooth with respect to its neighbors in the arch, its occlusions, and so forth. This self evident fact has not been neglected in modern dentistry. Modern operative dentistry has come to emphasize as a fundamental principle, the requirement that each operation ought to be so devised as to prevent recurrence of decay or injury to the soft tissues. This is to recognize that the operation is incomplete or unsuccessful if it does not leave the mouth in the most favorable condition possible.

If these considerations are admitted, as they generally are, then it becomes evident how important a place is assumed by the study of dental anatomy. And as a matter of fact, the study of anatomy has up to the present time contributed largely to the solution of the problem. It has been recognized, for example, that an intimate acquaintance with the forms of the various surfaces and with the surface markings is indispensable to a full comprehension of the theory of extension for prevention.

Now these facts have, as has just been said, for some time been recognized in operative dentistry. A little reflection will suffice to show what clinical experience abundantly demonstrates, that the same principles have an even more important application to crown-work. The subject of dental anatomy, insofar as it has important bearings upon operative dentistry, may be conceded to have been exhaustively treated in the two able and authoritative text-books upon the subject, published by Doctors Black and Broomell. These authors have left very little to be said or opportunity to add to our knowledge of the surface anatomy of individual teeth. But the making of a crown introduces new problems and makes new and searching demands upon our knowledge. We are confronted with the necessity of understanding the relation of the dentine and enamel to the contour of the tooth, and especially is it important to know the form of the enamel as it

\*Read before the Michigan State Dental Society, 1912.

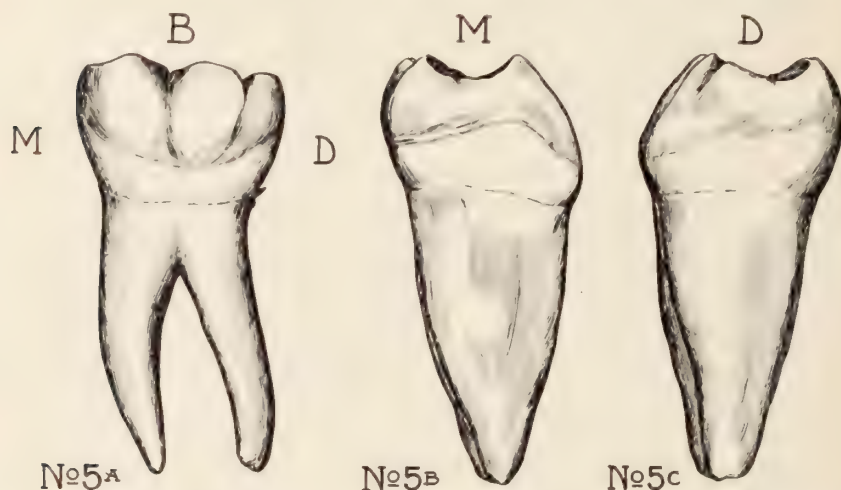
approaches the cementum. Drs. Damon and Reynolds have, for instance, thought this a matter of such fundamental importance as to warrant the undertaking of a large task in grinding specimens, taking measurements, and making charts. It is hoped that a practical application of their findings will tend to materially advance crown-work to a high rank among modern septic dental procedures.

That crown-work may hope for considerable improvement of the methods in vogue from the prosecution of such researches is made probable by two considerations. First, it has already been pointed out that important facts of dental anatomy, having a special bearing upon this department of dentistry, have hitherto suffered from a comparative neglect. Second, even a superficial and casual examination of the periodical literature of our profession reveals the existence of a widespread dissatisfaction. Editorials in our dental journals, called forth by Dr. Hunter's paper on the subject of oral sepsis, while generally resenting his attitude, often contained a tacit acknowledgment, especially in the case of the more thoughtful comments, that his strictures were not without some show of justification. And a few months later Dr. Herman E. Schages writing upon Empiricism in Bridgework, and publishing photographic illustrations of sixteen sample pieces of such work, draws the conclusion that at best the results of the work shown are "unsatisfactory, incomplete, unwholesome and unclean." And the specimens thus condemned were not the work merely of incompetents. Authors, clinicians and professors of prosthodontia figure among those at whose door the existence of these specimens may be laid.

A third consideration, which tends to bear out the two already adduced, is the general acceptance of the dictum that crown-work should be the operation of last resort. This aphorism is a clinical deduction. The pathological condition of the soft tissues about a large percentage of crowns, and the frequent production of unfavorable conditions acting as predisposing causes for the formation of caries in the proximate surface of the adjacent teeth, emphasizes the inferiority of much of our crown-work to the natural conditions which the crowns displace, and furnish the sufficient reason for considering crown-work as a last resort in restorative dentistry. One cannot help admiring the mechanical ingenuity which has found expression in the evolution of the artificial crown. But we are also compelled to acknowledge that the artificial crown has become conventionalized. It is an unusual experience to see a crown that exactly resembles the natural tooth. Now, this might not be objectionable if, with full knowledge and consideration of all the facts, we had actually succeeded in working out a real improvement upon natural forms. But I do not think that anyone will urge that this is the case. It seems rather that we have neglected to follow the guidance afforded by Nature's most favorable variations, and that instead of improving upon Nature in these respects, we have merely failed to take advantage of her hints and to learn her most obvious lessons. In short, we are paying the penalty of a certain lack of respect for that only

authoritative teacher, the court of first and last resort, Nature herself. And, in again making our appeal to this court for a further revision and examination of the problems involved, we shall but be acting in the spirit of all modern science and in the spirit of all great and valuable discoveries.

It follows, therefore, as a natural consequence, that we must adopt as our ideal crown one that will exactly reproduce, in all its essential details, the particular tooth which it is intended to replace. While every one of the



thirty-two teeth have important anatomical markings which should be reproduced, owing to their bearing on the production of favorable conditions, such an attempt would be needlessly tiresome, and I will confine my description to one or two teeth, at the same time bearing in mind the age of the patient and the variation from the normal which it might be necessary to reproduce, in order to have the crown in harmony with its environment. But such a generalization would still leave room for different viewpoints. It will therefore be necessary to go more into details. Owing to the early decay of the first lower molar, this tooth is perhaps the tooth where a crown would be most often indicated. Let us, therefore, select this tooth on which to build our ideal crown and consider the essential details bearing upon our problem in the order of their importance.

It seems trite to say that a proper root preparation is a prerequisite to a perfect fitting crown, and yet I am convinced that more crown failures can be traced to a lack of thoroughness at this stage of the work than at any subsequent step.

Not only is it necessary to have an intimate knowledge of the anatomy of the tooth and of the soft tissue covering that portion of the tooth from the gum line to the gingival line (shown in Chart No. 5. A, B and C), but it is important that we have a very vivid representation or image of this cervical portion during our instrumentation for the removal of the enamel. This means that this exacting and skill-demanding process cannot be per-



formed automatically, as is the case with a great many routine operations, but demands constant attention.

It is my belief that a proper root preparation for a banded crown, where the tooth is in normal position in the arch and the band is to extend root-wise only as far as the gingival line, requires the complete removal of the enamel.

Some departures from this rule will of course be necessary, to meet the variations constantly presented, in clinical practice. An important point to bear in mind during the enamel sealing, is the extent to which the gum cuff or free gum margin extends from the gingival line over the enamel of the crown. On this point I will quote Dr. Damon, the dental anatomist, at U. of M. He says, "I am of the opinion that we have a free gum margin, which varies from  $1\frac{1}{2}$  M. M. to 3 M. M. in extent, in an adult, under normal conditions, the margin being somewhat greater in the case of younger patients."

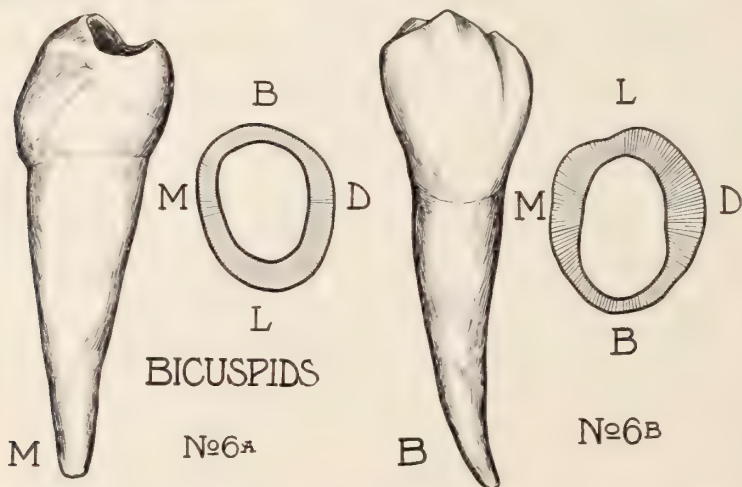
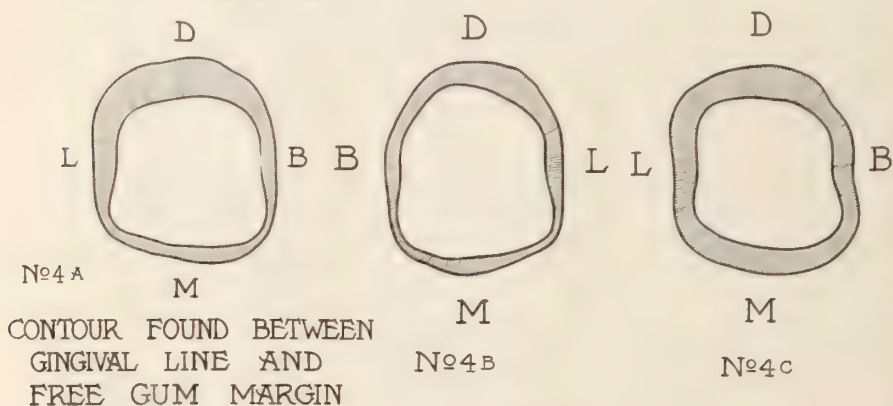
Now, the removal of the enamel from the dentine, for a space of upwards of 3 M. M., underneath the gum tissue, without doing injury to the gum tissue and the peridental attachment, requires so high a degree of surgical skill, and is so laborious an operation, burdensome alike to the patient and the operator, that we would like to be quite sure of its necessity before insisting upon it as a normal procedure.

A description of the relative proportion of the tooth occupied by each tissue will, I think, be convincing on this point. The contour of the tooth is made up almost entirely by the enamel. Beginning at the gingival line by a beveled or chamfered edge, it gradually increases in thickness until the points of the cusps are reached, where we will find the thickest enamel. This will account for the loss of color at the incisal, as the tooth receives its color from the dentine, and its white or white and gray value from the enamel. The enamel will also be found thickest underneath any ridges or elevations on the various surfaces. This thickness of enamel is formed by the increased convexity of the outer surface. The dento-enamel junction (or axial wall of dentine) passes toward the occlusal surface, with little or no convexity, only a slight inclination toward the axial line of the tooth. Now, if the anatomical description just given is accurate, the necessity of entire removal of the enamel seems obvious, if we are to have our crown in close contiguity with the entire gingival circumference.

Realizing the value of special training, in order to arrive at the most accurate deductions in regard to this question of dental anatomy, I have referred the matter to my colleague, Dr. Damon, for investigation. Some of the charts here exhibited were made by him, and the anatomical references incorporated in this paper are also to be credited to him. Dr. Damon has suggested a simple technique by which anyone may easily verify these findings. It is urged that this be not neglected, in order that dentists may have a more accurate perception of the difference between

the form of the tooth at the free margin of the gum and at the gingival. We will study these portions of an upper first molar somewhat in detail. You will note in drawing 2 that of an upper first molar, No. 4, A, B and C, a lower molar, and No. 6, A, a lower bicuspid. In each of these cases the crowns have been ground down to the free gum margin. Note the difference in the outline form of the dento-enamel junction, and the periphery of the crown at this point. Now, the outline form of the dento-enamel junction at this point is practically the same as the outline form at the gingival line.

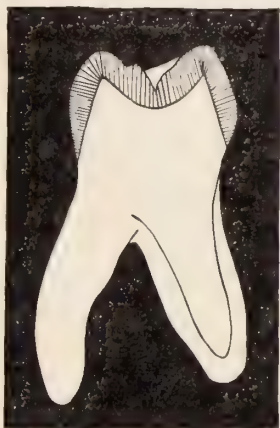
### LOWER MOLARS



We can easily verify this by taking an extracted tooth. Obtain the shape at the gingival by shaping a brass ligature wire around it at this point. Then grind down the occlusal until we have reached the free margin of the gum. It may be somewhat difficult to locate exactly this free margin after the tooth has been extracted, but the discolorations and etching of the enamel will aid us in determining it on the buccal and lingual and the point of proximate contact on the proximate surfaces. Now, place the outline form of the gingival which has been obtained with the wire ligature over

the dento-enamel junction at the free margin, and I think it will be found to be almost identical. Thus, if we are to obtain perfect adaption of the band at the gingival, the removal of all the enamel at this point is obvious.

In sealing the enamel, we should always bear in mind the points at which we should expect to find it the thickest. Our sections and drawings show a thicker deposit upon the mesial and distal than upon the buccal or lingual, and thicker upon the distal than mesial. This thicker enamel upon the mesial and distal we expect to find on account of the greater convexity of the crown at these points, and also as the free margin extends further towards the occlusal at these points, reaching, except in cases of extreme bell shaped crowns, to the point of proximate contact. There is



generally found a thickening of the enamel upon the mesio-lingual and disto-lingual angles, points which are especially difficult to scale. This thickening is probably due to the lessened mesio-distal diameter of the lingual root over that of the two buccal roots, while the mesio-distal diameter of the crown upon the lingual remains about the same as that of the buccal.

We often see in descriptions of buccal and lingual surfaces, that they are smoothly convex or equally convex from the gingival to the occlusal. Now, it has been my observation that the greatest convexity is toward the gingival on the buccal of both the upper and lower molars due to the cervico-marginal ridge at this point, which is so prominent in the upper first deciduous molar, but on the lingual the summit of the convexity is in the middle third (see drawing 1).

It is also interesting to note in drawing 1 (which is a view we would obtain by simply cutting off the distal convexity in the root preparation) that the enamel passes higher gingivally on the lingual than upon the buccal, and in drawing 3 ( a view from the buccal of a longitudinal section passing from the points of proximate contact), that it passes higher



on the distal than mesial. Note also the thickening of the enamel over the occlusal on both. This is an important anatomical point to remember in festooning and trimming the gingival end of the band.

A description of the instrumentation employed for the removal of the enamel, to be at all intelligible, would necessitate not one, but a series of lectures, supplemented by models and clinical demonstrations. But it is hoped that in this calling attention to the relation of the enamel and dentine to the contour of the tooth, the necessity for the removal of the enamel in its entirety from the tooth has been so conclusively demonstrated as to be recognized as a fundamental principle. If we adopt this as a standard from which a proper root preparation may be judged, and adopt the exact reproduction of the surface anatomy of the natural tooth, and especially of those forms which are recognized as having a special bearing upon the production of favorable conditions, as our standard of criticism for the finished crown, then we will at least have placed the principles which should govern the practice of crown work in a position which will not be inconsistent with the fundamental laws of prophylaxis.

It needs but a slight acquaintance with the current medical literature to realize the clouds of suspicion which are gathering over the field of crown and bridge work. It is being charged with the responsibility for many of the infective processes of the body, in several instances, by pathologists of such eminence that we cannot afford to overlook or disregard the warning.

In the *London Practitioner* for January, 1912, an issue devoted to the cause of the so-called rheumatism, is found an article by Kenneth Goadby (Pathologist and Lecturer on bacteriology, National Dental Hospital, etc.), entitled "Relation of Diseases of the Mouth to Rheumatism." This article contains a very convincing array of clinical deductions, and these deductions seem to be fully confirmed by the research work reported. Dr. Goadby makes the following remark about crown work, "There are crowns which are not the source of infection, but unfortunately they are few and far between. No more potent cause of oral sepsis, infection, rheumatism, anaemia and what not, exists than the crowned tooth, with which is included the bridged tooth."

From another source I quote the following: "There is no question in my mind but that the primary source of many of the infective processes of the body (such as acute rheumatism), is in pus-pockets about teeth, or from localized infection of the alveolar process, due to a variety of organisms. As to the port of entry to the circulation, it seems most probable that it is through the tonsil, and then through the lymphatics into the circulation. Other lymphatics, as those associated with the pharyngeal tonsil, no doubt have the faculty of passing pathogenic organisms into the blood stream, under conditions of lowered resistance of the organ or system.

"That the tonsils, or other lymphatic organs, are able to place a barrier to local and accidental direct infection in most cases, is apparent, but with

the repeated and persistent contamination from a protected nidus, whether it is from a fistula of the gum or defective crevice between the teeth and the bone, there is produced a lowered resistance of the tonsil and escape of the living organisms and their toxins into the blood, through lymphatics."

The making of a crown is generally regarded as a purely mechanical procedure, and it is often left entirely to the laboratory man. But it is my conviction that in the exact reproduction of the form and outline of the natural tooth, something more than mechanical aptness or ordinary



№ 1

Fig. A



№ 2

Fig. B



Photograph showing gingival contour on natural tooth.

craftsmanship is implied, for no phase of the art and science of dentistry calls for so great an application of the knowledge of anatomy, not to speak of the demand upon the imagination as a guide in the progress of the work. In short, this work requires the exercise of the rare faculty, attention to minutiae and detail. In the restoration of a tooth by a filling or inlay, some portion of the tooth is always left to act as a guide, but where the natural tooth structure is so far involved as to require restoration by crowning, and especially after the peripheral trimming is complete, there is nothing left but the dentine. The exact representation of this form in the mind can only result from minute observation. The next step, the exact reproduction of this formation in wax, is a requirement so exacting as to place this work high among the fine arts.

A reproduction of the gingival contour, of the enamel surface covered by the free gum margin, is of first importance. Ultimate success depends upon the probability of maintaining not only a healthy gum margin, but the stability of the alveolar process. The effect of persistent local irritation upon these tissues is too well known to need comment.

In reproducing the gingival enamel, then, we should reproduce the forms best suited to the protection and maintenance of the health of these

tissues. The form of the gingival extremity of the enamel is extremely variable. Teeth possessing a pronounced gingival ridge, known as bell crowned teeth, afford the best protection to the free gum margin. A reference to chart No. 1 will more fully illustrate this point.

Figure A represents a cross section of a root cut off at the extremity of the free gum margin. The gingival enamel is designated by the shaded portion. When the enamel is removed and the root is prepared for the reception of the band, a V-shaped space is left, which, if not reproduced exactly, or if not entirely filled, would be an exciting cause of so-called pyorrhea. The gum should hug the artificial crown as closely as it



did the natural tooth. The gingival enamel slopes from the gum line down to the root, and does not fit over the root as though it were a straight band or a barrel hoop. Neither does it run in a horizontal line around the root. On the proximate side it is directed toward the crown, forming a convex curve; on the labial, buccal and lingual it presents a concave curve toward the crown; the extent of this curvature is much greater on certain teeth than on others. For example, "the average length of the central incisor from the incisal edge to the gingival line of the labial is 10 M. M., and the gingival line approaches the incisal edge three M. M. closer on the mesial and distal. There is a gradual decline of the mesial and distal curvature from the central incisor to the first molar, where it again increases to seven M. M., and then gradually declines to the third molar, where the gingival line runs in an almost horizontal direction around the root."—(Black.)

Variation is a law of nature. The measurements given are intended to strike a general average. They will, in rare cases, be found to vary as much as two M. M. in either direction. The free gum margin is held tightly against the gingival enamel margin by many bundles of fibers which extend upwards, not only from the periosteum of the alveolar border, but also from the peridental membrane. Anything which interferes with the attachment of these fibers will cause the tissue filling the interproximate space to relax and eventually to recede. The narrowing of the interproximate space will have the same result.



In a serial review of the histological character of the peridental membrane by G. V. Black, he shows that a cellular change takes place in this membrane as age advances; also that the interfibrous tissue is much diminished in old age. That the alveolar process and gum recedes as age advances must be familiar to any one who has had the least clinical experience. These facts have an especial interest to us in our crowning operations, as eventually the line of union between the crown and root will become exposed, and if this union does not resemble the joint of an inlay, or if the cement is washed or dissolved from beneath the band, we have at once a predisposing cause of caries.

While much has been written with regard to the importance of preserving the normal width and form of the interproximate space and the marble-like contact, an application of this truth does not seem to have been very generally made to crown work. The majority of crowns to be seen usually have contact with some portion of the proximating tooth, "if this contact is not on a line with the buccal cusps in the posterior superior teeth and the incisal edge of the incisors, it will be impossible to reproduce the marble-like contact, to be found in the best formed teeth, and which is so desirable in lessening the area of susceptibility. This is also greatly facilitated by wide buccal and lingual interproximate embrasures, which allow the food to pass through them during mastication."—(Black.)

The rounding of the mesial and distal surfaces bucco-lingual and the form of the buccal and lingual interproximate embrasures, are well shown in the accompanying chart, taken from Black's Dental Anatomy. While



Photograph No. 1A  
Showing natural tooth.



Photograph No. 1B  
Showing correct reproduction.

a failure to reproduce the exact form and outline of the buccal and lingual surfaces will not be as quickly reflected in the gums, it must still be included as one of the essential features of an ideal procedure. While the buccal surface might be said to be convex in all directions, the highest point

of the convexity is normally just above the free margin of the gum. The slope towards the occlusal is much longer than the slope towards the gingival line. The effect of this formation is to protect the free gum margin, i. e., it prevents food being forced against it as would be very apt to happen if the wall rose straight from the gum. The correct outline is shown in photographs No. 1 and charts 5, B and C. Photographs No. 2 is an outline of the buccal and lingual surface in popular use.



Photographs No. 2

These crowns are not the work of incompetent or dishonest operators, but of conscientious men of known ability as operators.

The importance of reproducing the buccal and lingual surface, as shown in No. 1, must be acknowledged by any one who has paid the slightest attention to the inflamed and congested condition of the free margin of the gum, to be seen around the average crown, in order to consider fully the best form to be given the occlusal surface, we should need a separate hour. Hence, I feel I can do no better than to refer to the elaborate monographs on this subject by Bonewell, Weiss and Professor Gysi, of Zurich.

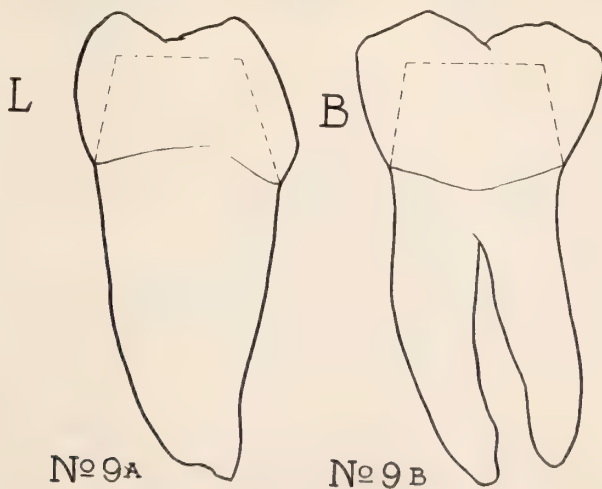
While the inflamed and congested condition of the gum margin to be found around the average crown may be due in a certain percentage of cases to inadequate root preparation, I still believe that in those cases where the band has been perfectly adapted around the entire gingival circumference (for there are many men in the dental profession possessed of sufficient skill to do this), there would still be a failure to reproduce normal conditions, for a single band does not usually restore gingival contour. It is rather a difficult matter to restore this highly important gingival contour with a single band. Such a band lies over and on the outside of the root and presents an edge utterly unlike the gingival extremity of the enamel, which is more in the nature of a heavy ferrule beveled to the point where it joins the cementum. The difficulty of contouring the occlusal end of the band to the marble-like contact, and of properly shaping

the buccal and lingual surfaces, without distorting the gingival end of the band, and vice versa, is no doubt the chief reason for neglecting these essential details. In addition, the shell crown is very often adapted only to the gingival margin. There is always the unpleasant uncertainty of not having it go to the exact place on the root for which it was intended, when being cemented to place.

I am perfectly well aware that most individual methods are chiefly important and favorable to the person evolving them. Yet I hope to show in my table clinic a degree of efficiency obtained by students, of not more than average native talent. This may interest you to the extent of desiring to know how I got out of the woods, so I will take you through paths which I myself have chosen, hoping that when you reach the open you will not declare the country uninhabitable.

From an accurate measurement of the root, taken at the gum line, a band of 22-k., 31 gauge gold is made. 31 gauge gold will be found much easier to swedge to the root than the 28 gauge ordinarily employed. The end of this band is cut on the bias (made in circular form) and the ends filed smooth in order that the cut ends will have perfect contiguity when brought together, for this is the secret of successful soldering.

It is easier to sweat the bands together, as the small amount of solder necessary to fill a perfect joint is difficult to handle. Any surplus solder after the joint is filled flows over the band and stiffens it, thus making

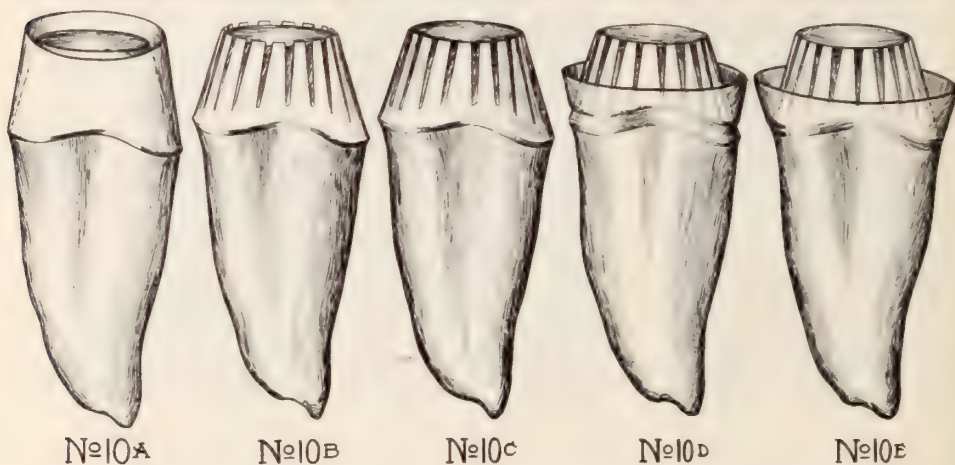


that portion of the band unswedgable. The gingival end of the band is now trimmed and smoothed to follow the gingival curvature of the enamel for that particular tooth, and it is then forced to position on the root. If the slightest irritation is caused in forcing the band to position, it will be due to one of three reasons. Either the root has not been properly trimmed, or the band is too large in circumference, or it is being forced up too far at some one point.



The band should never be forced beyond a point where the gingival end may be exposed by a suitable explorer. (Exhibit explorer). A definite mark should now be made around the occlusal end of the band to indicate the desired width, leaving space for a sufficient thickness of occlusal surface. The band is now removed and the occlusal surplus trimmed and then smoothed evenly by honing on a stone.

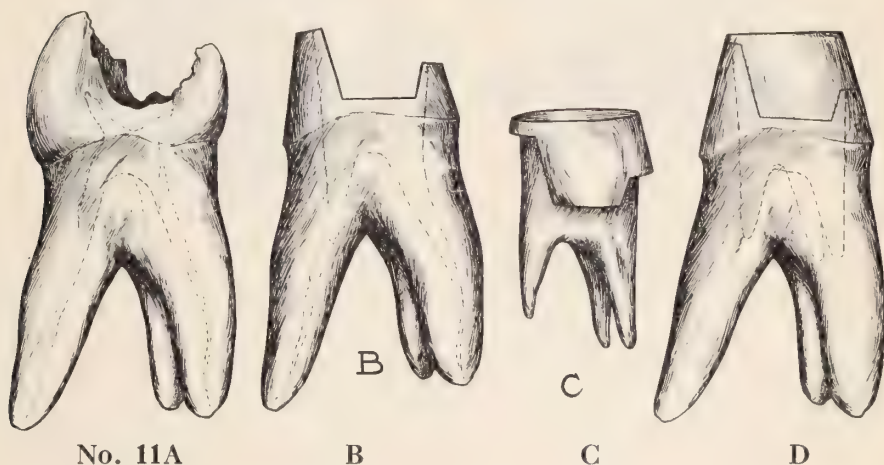
By the removal of the enamel, we have left a somewhat truncated cone of dentine (see charts 9, A and B), and hence our band would be in contact only at the gingival line as shown in chart 10 A, in order that the crown may fit the axial walls of the dentine and thus assure its going to the exact position on the tooth for which it was intended when being cemented



to place, the occlusal end of the band is notched with a jim dandy disk two-thirds of its width. It is then placed in position and these segments are burnished against the axial walls (see chart 10 B). It is then removed and a floor is soldered to the occlusal end. The importance of this floor will be appreciated as we proceed.

It is obvious that the condition just described would only occur where a comparatively sound tooth was to be utilized as an abutment in bridge work, and even here the teeth adjacent to the space to be bridged will have tipped more or less into the space, which as a rule necessitates the removal of some of the dentine in order to obtain parallelism with the opposite abutment, but where the walls of the tooth have become so badly weakened as to indicate a crown, the removal of the remaining walls of enamel will leave an insecure anchorage for our crown, and some sort of restoration anchored in the roots is usually necessary. The notched band shaped as in chart No. 10 B may be used as a matrix after placing on the root, the root canals and matrix are filled with melted wax. After this wax model is reproduced in silver, ankolite or some similar alloy, we have an ideal root preparation; i. e., as we have made the root fit the crown. Charts illustrative of this procedure are shown in No. 10 A, B, C, and No. 11 A, B, C and D.

A second band is made of 28-gauge gold, also cut on the bias, with the largest diameter towards the occlusal and made to fit at the gingival extremity (of the notched portion) of the first band (see No. 10D) and of such width as will allow its reaching to the gingival marginal ridge after being forced to position (see No. 10E). Our restoration is now placed in position. The first band is again placed on the root, and the second band is driven over the first band to within a thirty-second of an inch of its gingival extremity, the object of the second band is to restore gingival contour. It swedges the first band over the high places and holds it tightly against the root while it is being burnished into any concavities

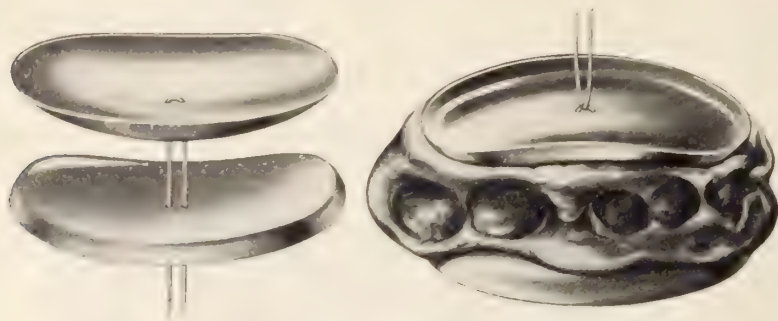


which may exist. It stiffens the first band, as two bands soldered together are very much less apt to become distorted by subsequent taking on and off, polishing and finishing, than a single band unstiffened by solder.

The two bands are now removed, being careful not to disturb their relationship. If the technique has been carefully carried out, the first band should be so tightly swedged against the gingival as to require some effort to dislodge from the root. Solder is now flowed around the gingival between the two bands. The bands are placed on the root and an accurate impression and bite is taken.

I wish to place especial stress upon the importance of obtaining an accurate impression, not only of the approximating teeth and their embrasures, but the occlusal third, at least of the antagonizing teeth. Without such an impression a faithful rendering of Nature variation in the particular case in hand could not be noted and copied. As has been previously stated, a failure to note and reproduce some slight variation may be a predisposing factor in the production of caries in the proximate surfaces of the adjacent teeth, beside causing the loss of that protection, which, as has been shown, the best formed teeth afford to the gingival tissue.

While plaster of paris is the most accurate material for this purpose, the patience and time frequently required in assembling the small pieces of a fractional impression no doubt discourage many from its use. By the use of these (show shields) impression shields suggested by Dr. Oscar Weiss of Minneapolis, it is possible to obtain a sharp, accurate impression in modeling compound. When the teeth are brought into occlusion the shields prevent the compound from spreading laterally, and consequently it is forced into the embrasures against the buccal and lingual surfaces.



Dr. Weiss' Impression Shields.

The routine method of flowing a slight film of wax on the interior of the band to facilitate its ready removal and running up the impression is next in order. It is a mistaken idea that time may be saved by waxing the crown in the mouth. A short cut that is surrounded by such unfavorable conditions is sure to result in a large percentage of failures, so that in the long run it is not a saving.

I am also of the opinion that time will be saved in verifying the articulation by trying the crown in the mouth previous to investing and casting. I think we have all passed through the humiliating experience of grinding down a carefully curved occlusal surface and wondered how it could have happened. While chewing is not, strictly speaking, an unconscious act, it might be looked upon as a type of habit depending upon a proper stimulus. The process of chewing becomes automatic and passes largely outside the focus of consciousness. When the patient is requested to chew on the wax model the movements of the jaw are conscious movements. The patient's attention is directed to that particular tooth and the jaws will be almost certain to indulge in a wider range of movement than is normal. Hence the articulation is sure to be exaggerated. On the other hand, if the root or gums are sensitive, as is very apt to be the case, consciously or unconsciously, the patient will favor that particular tooth. In asking the patient to grit the teeth from side to side, you will avoid calling attention to any particular tooth. This method, while somewhat empirical, has at least been successful in my practice.

In calling attention to the essential requirements to be obtained in the construction of an artificial crown, we have assumed that the conditions were favorable.



I am conscious of the fact that in clinical practice this is not usually the case, for where the natural tooth structure is so far involved as to require restoration by crowning, the conditions will be more or less unfavorable and the contemplated crown will meet the ideal we have adopted in proportion to the ingenuity shown in overcoming these unfavorable conditions, and this applies to every field of dentistry, the successful struggle to overcome unfavorable conditions.

The ability to express in wax on a plaster model which may be held in the hand, and under the most favorable conditions, our interpretation of the beauty and the plastic lines to be found in the surface markings of the enamel is what gives us the right to place crown-work among the fine arts, and in this he will be successful in proportion to the effort made to develop in the mind a more subtle quality of discernment and to intensify his faculty for the fine appreciation of the esthetic.

#### DISCUSSION

DR. M. L. WARD: I regret very much that I did not have an opportunity to get the paper before it was read. I did not, however, so am in no better position to discuss it than the others who are here. From the number of cuts, drawings, etc., that he has presented on root preparation, together with the time he devoted to this subject in the paper, you cannot fail to grasp the importance he attaches to this part of the work.

Any of you who have seen his work and that of his students must realize that he means every word of what he says regarding root preparation. From the title of the paper, I expected to hear him say more about the different kinds of abutments for bridges as well as the different bridges themselves. But I am not certain but that he has done more good by devoting his whole time to one of the fundamentals that is so often neglected. One of the first things that he brought to your attention was prophylaxis in connection with bridgework. It would seem that prophylaxis must be kept in mind by the bridgeworker if there is to be the best service from the bridge, and in this connection I not only want to commend the essayist in the presentation of root preparation but emphasize another part of the work which has a direct bearing on the subject of prophylaxis in connection with bridgework. It is the indiscriminate use of detachable facings and the substitution of cast backings for the swaged ones. Detachable facings that are put on without a good thick 24k backing cannot have the gold burnished as it should be over the borders. Any lower karat partially prevents this being done. Any facing that is cemented on with a cement line that can be seen with the naked eye is certain to be a trap for filth in a short time. And yet the fascination of casting has caused many to discard the old method of backing the facings, and instead they are casting a backing from almost any karat gold, oftentimes without having made a bevel on the porcelain before the wax was adapted, and the result is a much thicker layer of cement than should be used and a crack that cannot be burnished tight.

It would seem that whatever method was to be used to complete the piece of work there should be no deviation from the thick 24k gold backing, swaged to the porcelain after it has been beveled at the borders with a rather long bevel that will not allow the gold to pull on the facing during contraction. Casting can be done on the gold just as well and with a lower karat, and yet there is the 24k gold to burnish at the borders. Removable facings that are made to slide on from the end of an alloy backing are as far from prophylactic as bridges put on without the root preparation suggested by the essayist. Another thing might be mentioned which has about as much to do with prophylaxis in bridgework as has the root preparation and the use of facings. It is the use of too many teeth between the abutments. Oftentimes it will look much better as

well as be easier to care for if fewer teeth are used. This feature should be given especial attention between the abutment teeth and the first dummy, the place where the gingiva is first lost.

From what he has said concerning the double band for his crowns and the fact that he mentioned little else in the way of crown work, you might wonder, as I do now, if he uses only banded crowns. I am sure he will give his reasons for not mentioning other ways of constructing crowns, yet that I do not approve of the crown he is so much enthused over, but because most of us think there is a place for crowns without bands.

In conclusion, I want to emphasize a point that the essayist mentioned. It is the time necessary to prepare roots properly and construct bridges as they should be. The detachable facing with a bucking already made has made the construction of the dummies for bridges apparently easy and quickly done, though I fear it has not had the tendency to improve the quality of the work. The root preparation, as the essayist has called to your attention so forcibly, also takes much more time than is generally given to it. Unless there is a change in these two things there will not be the progress in bridgework that the importance of it demands.

DR. ORTON (closing): It was not my particular intention when reading this paper to describe a new method. I do not think that a new method in itself amounts to very much except as means to an end. My aim was to call attention to the importance of following out certain principles. When I was invited to come here a special request was also made to refer to this particular method.

It is necessary for the teacher to have some technique and the subject must have been carefully worked out in order to teach the work. When speaking of fitting a band as a solid piece of metal around a more or less irregularly shaped surface, I think the principle is wrong. You can only hit the high spots, and whenever you bend that band in one place you move it away from another, so that it is impossible, even if you get a perfect fit at the gingiva, to bend the band at other places without distorting it again at the first point or the gingiva. I have had those principles very carefully worked out in the engineering department of the University of Minnesota, and I think—I did not say anything about how the second band swages in or snugs the first band closer to the root, because that has not been quite worked out yet, but one of the teachers in the engineering department is making a line of experiments, and he claimed that in driving the second band on the first band is thickened in the concavities and thinned over the high places. I do not make a claim that the first band is really driven into the concavities, where the concavities are very deep, but in slight concavities it is. Where the concavities are very deep I slit the gingival end of the first band, and when the second band is driven over, moss fiber gold is packed between the two bands, and in that way you do not drive the metal as a whole into the concavities, but you drive it in piece by piece, not only part of it but all.

At a table clinic tomorrow I hope to more fully demonstrate this. Again, take for example this lower third molar: I think we all have had difficulty in trying to seal the enamel from the linguo-distal angle; you see, in almost every case, it is thicker there owing to the extreme thickness of enamel. The distal ridge, buccal, lingually is narrower than the mesial root, owing to the fact that the distal root has only one canal and the mesial root has two canals. If we have the anatomy in our minds while we are doing the sealing we will not attack the enamel with those big heavy sealers and push up into the gums in this manner. We will introduce the sealer under the enamel margin and bevel.

I don't want to get into the discussion of root preparation just now; it would take a couple of hours. Dr. Ward spoke of the fact that I always use the banded crown. I do not think he quite meant that. Where the periodontal membrane is attached crown-wise as far as the gingival line, as it is in youth, it is impossible to remove any of the enamel without destroying the periodontal attachment. This causes the free gum to recede, and the banded crown is contraindicated in such cases as that. Where the gum

extends as far as this shows here, the gingival enamel should never be touched. You cannot do it without destroying the fibres, which extend not only into the alveolar process this way, but extends up into the approximal space. This was referred to in a paper published in *The Dental Cosmos* (the author's name has escaped me for the moment), showing photographs of these fibres leading up to the interproximal space. This gives us a clear idea of what we are doing when removing the enamel from the interproximal space.

Now, as to the question of the greater cost in time and material in making the crown, I see no room for argument. If you put on a crown that is any way a source of infection or causes unfavorable conditions, you destroy the approximating teeth, and I think there are very few commercial gentlemen who would adopt such a policy as that. It is too much like the policy of "Let the buyer beware." Of course, I do not mean to say that there are not men in the dental profession who are, with the methods in vogue, making perfect crowns. I know there are, but it has taken fifteen or twenty years to acquire the skill to do that. Now the average man, when he is graduated from college, should have some degree of efficiency, and the reason I describe this method is because it enables the man of average talent to make a crown that is more generally perfect, or at least a crown less liable to destroy the approximating teeth.

## THE CONSTRUCTION OF A BRIDGE FOR CONVERGED TEETH\*

By W. O. Hulick, D.D.S., Cincinnati, Ohio.

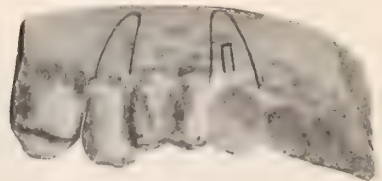
**C**ONVERSION, or malposed teeth, is the result of early extraction, and makes a bridge replacement very difficult and at times almost impossible. The models I have (Figs. 1 and 2, see note for No. 2) are typical of this condition and are seen every day, which shows how impossible it is to get an alignment.

To construct a bridge for these cases without an alignment you can readily see would be impracticable, inasmuch as the success of any replacement depends on adaptation of cap crowns at the necks of the teeth or roots to be used for abutments. Failing to get this adaptation, cement will wash out, ingress of food and saliva will soon invite decay, with loss of teeth, or roots so engaged as support.

The method I have adopted for many years is a bridge constructed in two parts (Figs. 3 and 4), which has separate posts with head to fit in



1



2

countersunk hole in inlay, or double crown, and can be used in any replacement, upper or lower, posterior or anterior, and also at any angle.

This separate post attachment can be used with the double inlay attachment abutment (3-a), gold cap crown (4-a), Richmond crown, or any

\*Given as a clinic at Northern Ohio Dental Society, 1912.



of the porcelain teeth with separate or unfixed pins, such as the Davis, Goslee, White, or others.

Fig. 5 will illustrate replacement of a practical case where a Davis crown was used on the cuspid, a Goslee was employed on the bicuspid. The bicuspids, as you see, had been lost for many years, the molar and cuspid became out of alignment, and occlusion so that a replacement made in one piece could not be seated owing, as I said before, to the position of the roots of molar and cuspid employed as abutments or piers.



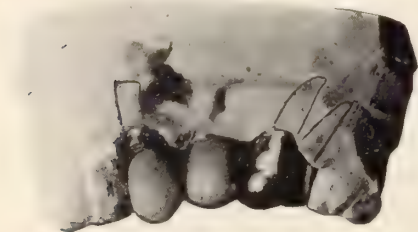
3



4

The molar had tipped over so that there was an impaction between it and second molar; also it occluded only on posterior cusp, which practically put it out of commission.

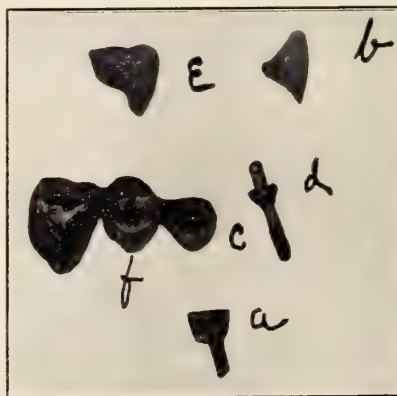
A natural surface gold crown was made for it, while on the cuspid root, which was badly decayed, the Davis was used, as follows: After proper treatment a band and top was made with tube, say  $\frac{1}{4}$  inch long, to take No. 14 post, attached (Fig. 6-A), this to be cemented on root.



5



7



6

A Davis crown (B) was then ground in to proper adaptation, with a space lingually, large enough for enough gold for anterior rest of bridge. A direct cast was made (C) as you would for any single detachable pin crown of 20k gold or platinum and gold alloy, as great strength is necessary.

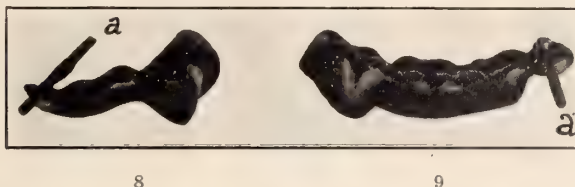
The post is made of platinum-iridium No. 14, with enlargement about mid-way, made in shape of head of screw (D).

Impression was taken with abutments and post in position, models mounted, a Goslee bicuspid (E) was ground in and a base swaged for it (F), then assembled and soldered. This base can be cast if desired.

The result was both satisfactory and gratifying (see Fig. 5).

Fig. 1 shows practical ease, which you will note is an impossible one for a bridge replacement all in one piece. Please note direction of roots.

Fig. 7 illustrates the bridge with perfect adaptation at gum margins.



The anterior abutment, as you see, was made with a cap crown two-thirds the original length of tooth; to this a tube was soldered extending into the tooth  $\frac{1}{4}$  inch or more. A cusp was cast for this to occlude with antagonism, with a countersunk hole for the post. This cusp is soldered to anterior end of bridge and rests on cap crown, the post to be cemented in after the other parts are cemented to place. This post can be made with screw to engage a tap in lower end of tube, which makes the removing of bridge less difficult in case it should be necessary at any time. Should a screw post be used, cement is not used to fix it.

Fig. 8 will illustrate to you the double inlay attachment employed at times, with separate post (A), which can be used very satisfactorily in cuspids where it is impossible to get an alignment.

Fig. 9 shows the screw post attachment (a).

Note for Fig. 2: This is a typical case of conversion, the bicuspids having moved back out of alignment. This case was corrected over five years ago, using Davis crown on cuspid (as described in Fig. 5). The cut does not show correct position of the roots.

## GOLD-PORCELAIN SHELL CROWN.\*

By Dr. E. E. Voyles, Indianapolis, Ind.

All agree that the superior bicuspid is the most difficult tooth to crown. Esthetics is against an all-gold crown and the delicacy and uncertainty of the root canals makes any dowel crown a very weak product. When the crown of the tooth is of sufficient length these troubles may be obviated by grinding freely from the buccal surface of the tooth. Then make a shell crown of gold with open buccal surface and floor, something after the fashion of a box crown. Fill this buccal surface with low-fusing porcelain and bake over alcohol flame. Or fill with a silicate cement.

\*Given as a clinic at Indiana State Dental Society, 1912.

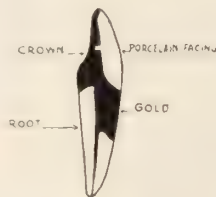
## A METHOD OF CROWNING AND RE-CROWNING.\*

By J. V. Anderson, D.D.S., Kane, Pa.

In cases in which a root carrying a pin crown has split off on one side—for instance, a central incisor that has a slab, say three-eighths inch or more, split off the labial surface, and this split extends under the gums the entire length of the piece split off, and extends to the center of the end of the root—it is not usually considered possible to recrown and preserve the tooth.

In such cases I proceed as follows: First, drill the hole in root as deep as is safe and convenient, and enlarge it sufficiently to admit a good, strong pin. Then fit a platino-iridium pin to the bottom of the canal in root. Then melt a little impression wax on the pin at what would be the gum line when the pin is in place in the root. Warm more wax and stick it around the pin; work it down on the one side and form it as nearly as possible to the shape of the slab that has split off. Then warm the wax and force the pin and wax to place, using a spatula to work the wax into the position and shape that is wanted. Then lift pin, wax and all out of the mouth and trim, repeating the operation until the wax on the pin has assumed the size and shape of the slab split off. Invest and cast gold onto the pin where the wax is, precisely as one would make an inlay.

Fit up a flat back and trim end of pin and backed tooth until the tooth will set on the pin in the mouth, in proper place to look right. Then fasten pin and tooth together with sticky wax, remove, invest and solder, and the crown is complete. This method will produce very satisfactory results if properly followed.



Where the slab is split off the labial surface, the palatal surface should be beveled from center of root if possible; if not possible, one of Ascher's anchor screws may be used to good advantage, setting it first in root and cutting it off to length that will not interfere with teeth of lower jaw. Then shave down a piece of lead pencil lead to near the size of the anchor screw, and place a piece of it in the hole in the wax that the screw has made, leaving enough of the end extending out to be held in the investment.

\*Clinic at Lake Erie Dental Society, 1912.



## AMALGAM—ITS USE AND ABUSE IN TOOTH RESTORATION.\*

By Dr. C. A. Priest, Marion, Ind.

THE subject which I have chosen is one that we come into contact with daily, and it is that continued contact with the use and abuse of amalgam as a filling material that caused me to write this paper, not because I can tell you anything new along this line, but just to remind you of a few points of importance to ourselves and to our clientele, lest you forget, while continually grasping for new ideas.

The subject is so old that it has become wrinkled and gray with age, but then if you get right down to the bottom of it all you can still see beauty and usefulness, and have reverence for those wrinkles and gray hairs.

There is no filling material today that is more widely, more carelessly, and I might say more recklessly used than amalgam; and still with all this abuse it is preserving more teeth today than any other filling material. And for those reasons alone we should give it some thought and not condemn a material that is doing what no other material can do. It is only right that we should strive to gain all there is that is new in dentistry, but not to such an extent that it will cause us to forget, to neglect, and to condemn the old and most useful of all, amalgam.

Amalgam is daily being condemned, and unjustly too, for is it not true that at least 99 per cent of the failures are due not to the amalgam, but to the operation?

The great trouble lies in the fact that amalgam is generally thought to be easy of manipulation, while if manipulated properly, it requires as much painstaking as the placing a gold filling.

The first and most important part of any filling is the preparation of the cavity. The building of a filling is based upon the same principles as the building of a house. First of all you must have a solid foundation upon which to build. Then in preparing the cavity for an amalgam filling you must seek for a solid foundation upon which to build, and prepare the cavity exactly the same as if you intended to place a gold filling, with one exception, and that is this: you should leave no marginal beveled edge as you would have for gold, for amalgam will not retain that thin edge which would be required to build out such a bevel. And many failures are due to that slight error.

Our ideas of a solid foundation may differ. What one may call a solid foundation may not be considered so by another. But the operator who works upon the theory that the foundation cannot be too solid, will have fewer failures than the operator who builds his amalgam upon a foundation composed of decay, which you no doubt have seen, or upon gutta serena, which you all know is often used and also is the cause of the failure of a

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\*Read before the Indiana State Dental Society, 1912.

filling, or one who builds between and upon walls of enamel unsupported by dentine, which is the most common cause of failures due to cavity preparation.

Assuming that you have a most perfectly prepared cavity, there are still other things that may cause a failure of the filling, one of which is the mixing of the amalgam. There are all manners of methods of mixing, from that of shaking in a bottle on down to the mortar and pestle. But it is not a mix that we want. A mix is what causes a failure and is that with which we so often come in contact. What we want is an amalgamation of the alloy used, and to amalgamate an alloy it takes something more than the merely mixing of the mercury and alloy together. They must be kneaded, and kneaded thoroughly, for at least two and one-half minutes.

A little more mercury is required (approx. 7 parts mercury to 5 parts alloy) to amalgamate the alloy thoroughly than should be left within the mass after it is amalgamated. But at no time during the process of amalgamation should the mass be sloppy. If it is, you have added too much mercury. And if too much mercury is added to an expanding alloy it will cause an increase of expansion of that alloy, and if too much is added to a shrinking alloy it will cause an increase of shrinkage in proportion to the amount of mercury used. The mass should take markings of the fingers with light pressure, after it has been thoroughly amalgamated with hand and mortar for at least two and one-fourth minutes.

Presuming that the cavity is properly prepared, and your alloy is thoroughly amalgamated, you have other things that would cause a failure of your filling, one of which is the building of a filling. It must be properly placed. And right here I might say that I think there is no better place suited to study the principles involved in building an amalgam filling than to watch some good contractor construct a concrete wall. First he finds a solid foundation; then he builds his form, the retaining walls or matrix as we would name it, within which he builds his concrete. And if you notice when he mixes his concrete, his materials are all measured, that he may get the proper proportion to give strength to his structure. And when condensing his concrete he uses the flat ended stamper, and if you should ask him why he uses a flat stamper instead of an oval one, he would laugh at you. His concrete is a soft mass and an oval ended stamper would only punch a hole instead of condensing.

The same is true with our amalgam: it is a soft mass and needs a flat end plugger to condense it properly. Therefore, in placing the filling it must be held in place by retaining walls and condensed thoroughly with flat headed instruments and not merely poked at with some instruments that punches a hole into the mass instead of condensing it.

There is another thing that if overlooked, would cause a failure of the filling, and that is the finish. No filling is complete until it has that finishing touch which adds both life and beauty to the filling, that which the unfinished filling has not.

As to the use of amalgam, it can be and should be used in all posterior restorations that are not restored by the use of gold fillings or gold inlays. And to prevent the abuse of amalgam in the restoration of lost tooth structure we must never leave any decay in the cavity.

Do not build upon guttapercha as a foundation.

Do not build upon or between enamel walls unsupported by dentine.

Never leave marginal bevel edges.

Do not use too much mercury.

Do not merely mix, but amalgamate your alloy.

Use a matrix in building contour fillings.

Use flat ended pluggers and condense the amalgam.

Restore the contact point.

Do not let the amalgam overhang the margin of the cavity.

Use a thin lining of cement in cavity to seal the joint between amalgam and tooth structure.

Be honest with your patient and use amalgam where you would use it in your own mouth under existing conditions, and build the filling to the best of your knowledge and ability and there will be fewer failures in amalgam restoration.

#### DISCUSSION

DR. W. C. HESSLER, Crawfordsville, Ind.: I have not prepared a discussion as I should like to have done because I had not the time. I was busy corresponding with some of the prospective members.

The paper, no doubt you will admit, contains many good things; the whole paper is good. I would like to give my praise to Dr. Priest for his effort, because we are indebted to any man who prepares a paper for our Association. It is not the use of amalgam that need be discussed so freely as the abuse of it. You all will see many cases of abuse, and especially not so much in the use of it as in the final results. The careful use of amalgam will repay anyone in the degree in which he uses it, because anything that is done carefully will add to our skill in the future. One reason why most of our men, especially our instructors in the various colleges and educational institutions, advise the use of gold is because it requires the highest type of skill if it is inserted so as to produce good results. We know that we see fillings very frequently such as one a young man, a patient of mine, told me about. He said that the dentist mixed up the filling material and pasted it in with his thumb. That was very quickly accomplished. I think we do ourselves a great injustice when we do such things as that.

I would like to reiterate Dr. Priest's remark that haste is a bad thing in the use of amalgam. It should be done just as carefully as the best filling we can insert, because an amalgam filling should be inserted to last as great a length of time as we could possibly expect any filling to stand.

As to foundations, I have never investigated very largely. I confess that I have filled many teeth on a gutta percha base. However, I have confined that gutta percha in as small a compass as possible, and I don't know because I have not made a close investigation as to the result of the cause of the failing on account of the unequal expansion between the tooth, the gutta percha and the amalgam as a filling. The essayist's advice as to amalgamation rather than mixing, I don't think needs any further comment, because anyone who knows anything about the characteristics of our amalgams knows that they ought to be amalgamated rather than mixed, and in the dryest filling material of this character, after the mercury has been thoroughly expressed, you will always find an excess of mercury after thoroughly working your material into the cavity.



As to the round and flat face plugger or burnishers, on this point I might say that the flat face plugger does accomplish the tamping of the filling into the cavity; but as Dr. Hewitt once demonstrated and showed—who, by the way, is the originator of what was known as stereon alloy—very poorly formed cavities will retain an amalgam filling if the first portion of the filling were burnished against the cavity wall, and I believe that I have demonstrated that to my own satisfaction, that it is true. The first portions of the fillings should be burnished with a round burnisher, rubbing it into the surface of the tooth structure, and I believe we get a great deal of retention in that way. Further than this, I do not believe that there is anything that I can add. I would like to again say that Dr. Priest's paper was very good.

DR. J. O. ZUBROD, Evansville: This is a subject that is near and dear to me. It does us good to listen to it every once in a while. I am satisfied we will go away today and put in better amalgam filling for about two weeks, and then we will forget about it. The whole method of spoon preparation of cavities and the old amalgam fillings are very wrong. Yet you don't hurt the patient while you are doing it. That is why some of the older practitioners are still using the spoon preparation today instead of flat surfaces for fillings. In my opinion, amalgam should be eliminated as much as possible for filling material. Formerly we put them in the distal surfaces of teeth and other inaccessible places where we could not get a direct blow for the hammering of gold. The gold inlay today has taken that place, and the big abuse is in the placing of amalgam filling in the mouth of the patient who can afford gold filling. Another abuse of amalgam filling, is placing the same in approximal surfaces of the temporary molar, for you cannot get good cavity preparation in the mouths of the little people. Another abuse is the placing of amalgam filling in the distal surfaces of cuspid teeth just because you never could put any gold filling in there, but today you can put in an inlay. I also might say in the first bicuspid and mesial approximal surfaces of second bicuspid it is an abuse to the patient to put amalgam in these teeth. We do not have to do it today because the inlay takes the place. If as much care was used in shaping a cavity for amalgam fillings as we use for inlays, then our amalgam fillings would be better fillings. The greatest use of amalgam fillings today is in the mouth of all classes of cavities for poor patients, and we all have plenty of them, and especially we from the smaller towns where they cannot afford to pay a larger price for gold.

Dr. Priest's paper needs no comment. It would do us all good if we who are here today went back home and got out our old C. N. Johnson and G. B. Black books and look up this subject, because we all get in ruts and stay there, and every time we come to a meeting we turn over a new leaf for about two weeks.

DR. E. P. HERRON, Indianapolis: I want to just speak a word in regard to the older dentist. I want to say that the younger dentists are much to blame for the way they handle amalgam, because they are equipped nowadays to do better work than the older dentists were at the time that they inserted amalgam fillings. In the first place amalgam fillings, properly amalgamated and properly inserted, will save more teeth, two to one, than any other filling put in the mouth. In the first place there is not one in fifty that knows how to mix amalgam. They do not know that when they add too much mercury and rub the fillings together that in squeezing that mercury out, that it destroys the combination of the filling. The combination is changed from that which it was intended to be. It is not amalgamated long enough. As the doctor said, it will take from three to five minutes to amalgamate amalgam, as it should be, and there should not be any surplus squeezed out to amount to anything. Another thing, the cavities should always be cut down until they are solid. Never show any mercury on a tooth when you are going to fill it. You must have a solid wall, and you must cut your dentures, and if you will cut them the same as for a gold filling, and adapt your cavity and keep your fillings afterward, I am sure you would have a much better filling, and not only that, but in soft teeth, where you can hardly get a good foundation, if you will take a solution of 25 to 30 per cent of nitrate of silver and just swab that around

a little, and then take a piece of cotton and wipe that out and insert your filling in those poor chalky teeth, you will save them four times longer than in any other way. In doing that your filling discolours, but you have got a filling there like the old Lawrence amalgam, and that has quite an amount of copper in it, and these fillings always turn out very well. That was the secret of that filling, holding where other fillings failed.

Now in regard to a great many using gold alloy. I would not give five cents for ten per cent of gold in an alloy because where it is cut up the mercury eats the gold up, and all the different alloys in the amalgam; and the length of time required to amalgamate depends upon a difference in the nature of metals; whether you have a high percentage of silver or tin, or low percentage of copper, in your different formula.

I think the doctor read a splendid paper, and I think if we will adjust every point in putting in our filling we will be better off.

DR. D. A. HOUSE, Indianapolis: I must apologize to the essayist for not hearing the paper. I just came in. I was unavoidably detained, as we usually are. I cannot discuss the paper, because I did not hear it. But I will say this, you always find me a friend to amalgam. I do not think its use will ever be eliminated. I do not think its use should ever be eliminated, and if you will give it the consideration that you do any other agent, gold inlay, gold filling, porcelain inlay or what not; if you treat amalgam, give it the same consideration that you do any other material, and take the same pains, I believe that within ten years from now there will be more amalgam used than there is today, regardless of what the gold inlay is doing, or regardless of what any other material is doing. I am aware of the fact that a great many operators claim that they do not use much of it, and have no place for it, but it is not because of the material's fault, or it is not because the material will not do what it should do. It is simply because they are prejudiced against it. I want to say that if we will take the pains and the degree of care in working with amalgam that it deserves, the same as we do with the working of any other material, it is going to stay right with us today, I believe, and I base my belief on the report that was made a short time ago by someone who read a paper who wrote to a number of dentists in Illinois, and who addressed letters to a number of different dentists asking for the percentage—in this paper it was something like the percentage of operations that were made of alloys and in which ranged anywhere from 40 up to 60, depending on the location in which the dentist was practicing, as to the scale of the percentage. For instance, in some of the smaller towns the percentage of alloy operations ranged every year, as high as 60 or 70, while in Chicago or some of those larger places it was down as low as 40 or probably lower than that. I forget the exact percentage. But with all that you must admit, you cannot help but admit, that amalgam has saved more teeth than any other filling material. That is a fact, and it has saved them well. We have exceptions of course as well as in any other filling material, but if it had been worked properly, taken the same pains with—and I mean by that, don't feel that because amalgam is plastic and you can put it on an instrument and shove it in any kind of a cavity, that it is going to be all right. It will not. Take the pains to separate the teeth, make space, prepare your cavity with the same good judgment that you do with gold fillings or gold inlays, put on the matrix as in an approximal cavity, pack your alloy in there as it should be packed, use the proper instrument, and when you are through, finish it the same as you would a gold one. You would not think of filling a tooth with gold and burnishing it over a few times; no, you have discs and strips, and bring it down to a flush margin, clean and smooth. I want to tell you that if you take the same pains with amalgam that you do with other materials you are going to use amalgam as long as you practice dentistry, and be perfectly satisfied with it. I do not know that I can add anything more. Every man has his own peculiar way of working alloy. There are some ways better than others, of course, but if we will read up on these things in the late literature that is brought out concerning the work with alloy, there is no reason why there should be very much of a variance in the manner of working it. The sole cause of the majority of failures in the working

of alloy is that you do not take pains to do it right. Fill it right, and prepare your cavity right, and allow the work sufficient time, and the percentage is going to increase. As one of the speakers has said, there are certain classes of people who are financially unable to pay the fees that are necessary for expensive inlays or fillings. You can render these people a service with alloy that they cannot afford to pay for in other classes of material. On the other hand, there are people who can't afford to pay for the higher class of work, if you want to call it that, because it shines like gold, and is gold, but I do not so consider it. I do not consider it any higher class of work than alloy. You can make just as high a class of work on alloy as any other material you use, and there are people who can afford to pay the fees you should have for your gold work, and there is no reason why you should not have a good fee for your alloy work as for the other. You render a service and why not get a fee proportionately as great as for the other? (Applause.)

DR. F. R. WILDER, Louisville: We do not any of us know anything about amalgam. I am sure of that. However, down our way (Kentucky) we have thought of this subject and we have examined about forty different makes of alloy, and we have found that those that approximate the percentage of silver, the formula of Dr. Black, of Chicago, is the best. We have examined about four or five that had showed about one-quarter of a 1,000 shrinkage.

It is hard to regulate the shrinkage and expansion of course. In order to prevent the squeezing out of this mercury which I believe contains some of the proper elements to make a correct mixture, Nate Garhart was down in Louisville one time and he had a micrometer with which he examined his alloys, and he read a paper before a few of the men in our city. He made no mention of this fact, but I later asked him this one point, and he said he did not think that made any difference. The next time I saw him was at the Indiana State meeting, and I noticed in the paper that he read at the Society that he brought out this point that you mixed the alloy and mercury properly and should avoid the displacement of any precious metal.

I was asked to speak, but I could not add anything more to what he had said, because he had brought out one point that I had thought before, so he not only concluded no doubt that that was the proper thing to do.

I think, as some have said here, that alloy has saved more teeth than any other filling material, because it can be so easily manipulated and placed in a tooth, and where an inexperienced operator is using a filling, rather than use a gold filling that might not give perfect satisfaction will resort to amalgam, as he is sure he can place that in the tooth. He can place it in inaccessible places of very irregular teeth. We build up the teeth with the alloy in posterior cavities that would be impossible to fill with gold as it has been heretofore. We have the gold inlay, and of course that has eliminated the use of alloy to a great extent, and I believe it should press the use of alloy out of existence as much as possible, because I believe alloy is a very inferior filling. I did not hear the paper, although when I saw the program I thought I would like to hear it, because I knew that there would be some good points in it. At our next meeting in Louisville we will have quite a series of different papers and clinics on this one subject. We will take up this one class of filling again, and try to bring out the good points and how to use this alloy to obtain the best results, and I feel sure that it will do us a great deal of good but I believe that we ought to eliminate the use of amalgam as much as possible. It discolors the teeth very badly and is very unsightly in a few years. Every one, nearly, who is capable of paying for a filling of any kind, will usually, under persuasion, have a gold filling or gold inlay. The amalgam makes the mouth unsightly and it is also an eyesore to the patient whenever they observe their teeth, where, on the other hand, a gold filling is always a pleasure and it preserves the teeth better. As I have said, I believe the high class of alloy made after Black's formula, is preferable to any other that we are using. I do not believe that there is anything else I can say only that I have used a great deal of alloy, not because I was not capable of using the gold, but especially in inaccessible cavities.



DR. FRED J. PROW: I sat there fidgeting in my chair and could hardly keep still until Dr. House got up, and stole my thunder. Now Dr. Wilder has made some statement which brings the thunder back to me. In the first place, I cannot agree with him at all. I maintain that an alloy filling when properly placed from the formation of the cavity to the polishing of the filling is as good a thing, regardless of cost to the patient or labor to the dentist, as anything it is possible to place in the mouth, a gold inlay or anything else. A properly placed alloy filling is not an unsightly thing to me. An improperly placed alloy filling is unsightly to every man. I believe almost exactly as Dr. House does as to what makes a good or bad alloy filling. The truth is that this is a material that may be abused, in the hands of different operators good and bad. It not only can be, but it is abused. I could not sit here longer without rising to my feet and expressing my opinion of it. The man who will take the pains with the alloy filling that he would with his gold inlay can in less time make a restoration that will save that tooth as well, and I defy any man to do it better with a gold inlay. The trouble is that we do not, a great majority of the operators, give it the attention, the preparation and time necessary to produce a good filling at all. That is why it is in such bad repute. I feel that we can, every one of us, make restorations that we will not only be proud of, but that the patient will be proud of. Occasionally we see coming from operators' hands alloy fillings that have lasted for years, the difference being one operator was careless and sloppy in his work and another was careful. It is a material that can be abused to the limit. I know of nothing that has been abused more than the alloy filling and I want to compliment Dr. Priest on his paper and endorse what Dr. House has said. I take some exception to what Dr. Wilder has said. I am sure an alloy filling put in right with proper cavity preparation and properly polished and finished, makes a splendid, durable restoration. If you will give it the same time that you give your gold inlay, you will find that it will stand ten to twenty years and sometimes longer. It will give you just as good service if used properly as it is possible to give. I doubt very much whether the *finest* gold inlay is any better than the *finest* alloy filling. I do not wish to be understood as criticising any other filling material, but I do want to defend the alloy filling used properly. I thank you.

DR. WALTERS: I have a little request and I thought this would be a good time to make it. I am about to relate a personal experience whereby I got mercury from amalgam on my hands; and while it is not the proper way, nine out of ten of you will do it that way. A little circumstance came up which caused me to change my method. At that time I had a bad thumb and was wearing a finger stall; my finger became infected from the patient's mouth. Now I use a finger stall to mix the alloy and find it works well. I was relating this to a professor and he said: "Do you know of another case of that kind? I have to deliver a paper before the New York Chemical Society in the fall on Mercurial Poisonings." I said, "I am going to the state meeting and will put it before the Association and if any there have had a like experience I will try and get their names and addresses so I can write them and get the points and details. No names will be mentioned in giving this paper. They will simply be marked as exhibit A. and B., and if you will let me know if you have had similar experiences it will be a step toward the advancement of science and I will consider it a favor myself.

DR. MORRISON: As long as there are about one hundred and fifty people manufacturing alloy and putting it on the market all the way from \$5.00 for ten ounces to \$10.00 for one ounce, there will be a very wide difference of opinion as to the value of alloy fillings.

I have seen many alloy fillings, some of my own make, and from the hands of others, that have been in place twenty-five or thirty years and yet show perfectly clean edges and no recurrent decay. What does this mean? It means that somewhere in the wide variety of formula in use there is an alloy that, worked under proper conditions and care, will give as good results as any other material.

The essayist says that he has confidence in the perfect alloy filling as being as good as a perfect inlay. I believe that I will go a little farther and say that in posterior teeth it is better. I am not saying that the inlay will not come into a wide usefulness. My judgment is that the best value of the inlay waits the discovery of an absolutely insoluble bite. I have not seen an inlay that after ten years looked as good as when it was put in. Five years since I looked at some large inlays that made me ashamed of my own efforts. I have watched them. Now the signs of failure are manifest.

I am afraid that many of us are indiscriminate in the selection of the alloys we use and careless in the use of it.

The doctor here from Louisville says he knows nothing about alloy. I am afraid that few of us know much about the composition and characteristics of the alloys we use.

Someone recently sent me a small vial, asking me to place an amalgam filling therein, to be shown here at their clinics. The alloy that I happened to have at the time was from one of the most prominent manufacturers in this country, but its behavior was so different from anything I had had under the same name that I hesitated to place it in the vial and it may not appear very well packed. Here is the uncertainty and discouraging feature of amalgam work; two packages from the same manufacturer and supposed to be alike may behave very differently, and one who expects good results might well exercise considerable care in the selection and testing of the alloy he uses.

Something was said about it being an "abuse" to put amalgam fillings in the mouth of a patient who could afford gold. As I look at it, it should not be a question of ability to pay, but of what material will best save the teeth. It would certainly be an abuse to put gold in the molars of a patient because he could afford to pay when the alloy would promise the best security.

DR. EISENHAEUER, Bloomfield: I suppose I am the man that Dr. Morrison referred to as sending him bottles. I have been making some tests of alloys for some time. I sent out ten models to different practitioners over the state. I do not know them personally, but nine of them came back. I have them with me and will show them at my Clinic and you will be surprised at the failures that most of them are. The packing of the alloy, I think, is the most important part of the alloy filling. You cannot pack an alloy filling with a large instrument, nor with a flat instrument. You must iron the alloy into the walls of the cavity and unite the atoms of the alloy together. I have made several tests and have the samples in glass tubes, and if you will try them you will find it as I say. As to the doctor's absorbing mercury from mixing alloy in the hand, I think that it has been demonstrated by Dr. Black of Chicago, that mercury in metallic form might be taken up in the circulation.

DR. E. R. KIBLER: When I heard the statements of some of the previous speakers I could not let them go unchallenged. Before I say what I have in mind on that subject, I want to say I enjoyed Dr. Priest's paper and think all his points are very good, and if we will follow them we will put in better alloy fillings.

The gentleman sitting next to me says that we could charge ten dollars for alloy filling the same as we do for gold filling if we put in better fillings. I think there is more truth than poetry in that statement. The trouble with us is that the minute we think of an amalgam filling we think of a dollar or fifty cents. That is what we want to get away from. It should take us from one to one and one-half hours to put in a good amalgam filling and prepare the cavity properly. Instead we do it in about fifteen minutes on an average, and fifty cents is all it is worth. How many of us ever think of polishing the amalgam fillings? How many of us would let a gold filling go without polishing it? We cannot afford to polish our amalgam fillings for a dollar or fifty cents. The minute we wake up and charge in proportion to the time we put on amalgam fillings, at that minute we can put in good ones. Dr. Crow said that he considered, if I understood him correctly, that a good amalgam filling was as good as a gold filling or inlay. I do not believe it and never will. I did not intend to say a word, but I could not sit here and allow that statement to go by unchallenged, and I am one that does not believe

it, and I am up here to say so, and I don't believe that the man that hides behind that mistake is doing what he should do for his patients. You take a good amalgam filling and compare it with a good gold filling. Don't compare a perfect amalgam filling with an imperfect gold filling. That is not fair. You take a perfect amalgam filling and take a perfect gold filling and at the end of twenty-five years compare the two and see which tooth is in the better condition. I would be willing to put up money that the one with the perfect gold filling would be in better condition, and will be better looking. In the first place amalgam has not the edge that gold has. In the second place with the large contour in amalgam, you cannot give the perfect occlusion that you can with the gold inlay. I do not care how skilful you are on carving cusps, and restoring contacts, you cannot do it with amalgam, and without these essentials you do not get perfect results. I care not what the filling is, if you don't get perfect occlusion and contact, the life of the filling is impaired. That is the reason I argue the gold inlay in preference to the gold filling, because you get better contact and occlusion in that way than any you can make providing it is large. I am glad that I can say I use very little amalgam, and not ashamed to say it; but I do say this, that I think that a man is at fault that will put in a gold filling in distal surfaces of molars where he cannot get to it, and knows that he cannot get a perfect filling there. That is the place for an amalgam filling. A good amalgam filling is better ten to one, than a poor gold inlay, and the gold filling that is not condensed sufficiently. Thank you.

DR. J. E. CRAVENS: The paper is an excellent one and I am disposed to agree with every gentleman who has made any remarks on this subject. I want to call attention to two or three items that have been overlooked. I think in preparing a cavity for amalgam the dentist should take the same pains with the margin that he would for an inlay or for a gold filling.

I want to call attention to a point in regard to manipulation which has been overlooked. A number of years ago a dentist came from Germany, by the name of Herbst. He told us a number of things about amalgam, about using little agate burnishers for working it. That did not amount to much, because the steel burnisher worked just as well. But he told us the use also of a cotton ball in a compound approximal cavity in a bicuspid or molar. You take a little ball of cotton, roll it tight, and rub it back and forth with the pliers on the amalgam in the cavity, and you can make that amalgam creep until it will go all the way around between your band matrix and tooth. I want to especially commend what was said in regard to taking first a small amount of amalgam and burnishing it to form the lining of the cavity; I think that is a fine thing to do. In regard to failure of filling by not making retaining form of cavity, the dentist whose mechanical judgment will not enable him to discriminate when he has a retaining form for his cavity, whether for amalgam or anything else, cannot benefit from any argument here. I thank you, gentlemen.

DR. PRIEST: I am very much surprised at the interest manifested by the people who have discussed this paper. I do not feel that it was so much the paper as it was the few remarks made in the beginning of the discussion, that caused the discussion, but nevertheless, I think if you would carry home with you what has been brought out in the discussion you will render better service with your amalgam work than you have been able to do before. There was someone in the beginning that said something in regard to eliminating amalgam altogether, and I believe that that flowed from some place down toward the southern side of the state and over in Kentucky. It might be all right for those people down there to eliminate amalgam, but the people in this part of the state, I think, feel that they are not quite ready to eliminate amalgam, because I think that they are willing to spend the time necessary to make the amalgam filling as it should be made. I do hope that you will do what I said in my last remark—be honest with your patients. Put amalgam where you would put it in your own mouth under existing conditions. I do not believe that there is any one here that would not use amalgam in some places in a patient's mouth. Every filling material has its place and



no one filling material will render the best service in all cavities. Therefore use amalgam where you know it will render better service than any other material that you can use.

I think that Dr. Kibler brought out one point very nicely when he said, "Of course you would put amalgam in some places because it is a fact that you cannot be sure of a good joint with a gold inlay or a gold filling in some restorations."

One dentist said that we should not put amalgam in temporary teeth. I would like to ask what kind of a filling he would put in that would preserve the temporary teeth longer than if he put the amalgam in and put it in to the best of his knowledge and ability. To do that, you will have to put a cement lining under all fillings, regardless of whether they are of amalgam or gold. You can put a cork in a bottle and it will not seal that bottle as closely as if you put a cement lining in the joint, and to make a good amalgam filling you want to seal the joint. Did you notice that filling that I had soaked in red ink for six months? I packed that filling the best I knew how with an oval-ended instrument. You will notice there are one or two slight places where the ink penetrated into the union between filling and tube. Now if I had sealed that tube with a layer of cement and forced my amalgam into it while plastic, it could not possibly have leaked.

Some one spoke of amalgam being an eyesore. It may be, but not if put in as it should be. I, in my paper, wanted to bring out the abuse of amalgam. It is the abuse that causes amalgam to be an eye sore. It is the abuse that causes amalgam to be a failure; it is the abuse that causes us to condemn the amalgam and want to eliminate it.

I threw in one phrase in my paper, that I wanted to cause discussion, but seemingly you have overlooked it. I said that we should use amalgam in all places in posterior teeth not restored with gold fillings or gold inlays. I thought sure some one would jump on me in regard to what I am going to do with the shell crown and the acolite fillings. I have no use for either one. I think there is no use for them unless there might be some use for the shell crown in bridge work.

In the closing of my discussion I want to emphasize the last sentence I made. Be honest with your patients and put amalgam exactly where you would under existing conditions, in your own mouth, and work to the best of your knowledge and ability. You will then have fewer failures in your amalgam restorations. I thank you.

## GOLD OUTLAYS.\*

By Dr. K. L. Myers, Whiting, Ind.

Prepare the cavity without steps or undercuts. Disk wall straight and smooth, drill a pit at base of cavity 2-16 of an inch deep and one at the cutting edge of tooth (use a bur the size of a 23 gauge wire), both with the parallel wall of tooth. Then make a link out of 23 gauge platinum wire and fit to these pits. Now burnish matrix same as for porcelain inlay, using 36 or 38 gauge of pure gold. Punch holes to correspond to pits in the cavity. Put in the wire and stick both together with wax, remove and invest the base of filling side with the best casting investment compound you can get. Now melt out the wax and flow full of 22-k. solder. Polish and cement in the cavity, using heavy pressure or drive it in with wood and a mallet.

\*Given as a clinic at Indiana State Dental Society, 1912.

"If there's any little forget-me-nots along the road, you just pick 'em and make a posy. Don't be waitin' for American Beauties."

## USEFUL HINTS.

By M. M. Brown, D.D.S., Macon, Miss.

To remove gum tissue projecting into carious cavity, apply trichloroacetic acid on a small pellet of cotton to same, and in a few minutes the gum can easily be removed with a spoon excavator. Also apply same to gum tissue overlying third molar when badly inflamed instead of lancing the gums or trying to remove this tissue with the scissors. Apply on cotton wound around a nerve canal plugger, protecting the tongue and cheeks from the action of the acid with absorbent cotton rolls.

An improvement on the lathe chuck used to hold sand paper is to telescope over cylindrical part of same a piece of rubber tubing and then over this either emery or sand paper strips of desired length and retained by wrapping with thread or cord. The rubber being flexible makes this fine for dressing down a plate, is rapid, inexpensive and quickly made.

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**DENTISTS MAKE TOO MANY SACRIFICES FROM AN EDUCATIONAL, SOCIAL, RELIGIOUS, PHYSICAL AND FINANCIAL STAND-POINT.\***

By D. A. Rosenthal, Pittsburg, Pa.

**T**HAT the dentist is making too many sacrifices from an educational, social, religious, physical and financial standpoint will be conceded by some of my contemporaries who are conscientious in the practice of their profession, but at the very outset, to avoid the inevitable controversy, allow me to state that this paper is merely the statement of a personal opinion, consequent upon the reiterated circumstances which obviously must have occurred in my practice of twenty odd years; and it is written with all deference to the prejudices and pre-deliberated conclusions of my colleagues.

I shall not attempt to exhaust my subject—this is unnecessary—but I shall merely touch upon each topic. In a subject such as mine, which is almost of general interest, most of the discussion must necessarily be based upon a dissension of opinion as regards the *meaning* of the terms and expressions that I may use; therefore I shall be as specific as possible and endeavor to avoid the promiscuous use of any ambiguous parts of speech.

We are a set of men who, for causes too numerous and otherwise obvious to mention, have harnessed our bodies, minds and souls to a profession called dentistry.

It is only necessary to direct our thoughts to the early history of our noble profession in order to find, by careful investigation, how crudely, unscientifically and actually ridiculously teeth were, in the past, substituted, filled, extracted, and diseases of the mouth treated, so that we may, superficially at least, realize the progress achieved by the profession and the

\*Read before the Odontological Society of Western Pennsylvania.

infinite benefits it has contributed to mankind up to the present time. It is scarcely possible for the layman to appreciate, even in a slight degree, the countless sacrifices that dentists have made to make this advancement possible. Of course we may find cases where there has been little sacrifice, but these must be eliminated if the subject be considered in its entirety.

It is surely a high and noble spirit to make sacrifices, because it is generally assumed that every man, no matter what his goal may be, is aiming at something which in his own estimation will promote his happiness to a considerable degree. His conduct is not determined by his will; it is determined by the object of his desire. Adam Smith, in laying the foundations of political economy, expressly eliminates every other motive. He does not say that men never act on other motives; still less that they never ought to act on other motives. He asserts merely that as far as the arts of production are concerned and of getting and giving, the action of self-interest may be counted upon as uniform. What Adam Smith says of Political Economy Mr. Buckle would extend over the whole circle of human activity.

Now, that which especially distinguishes a high order of man from a low order of man—that which constitutes human goodness, human greatness and nobleness—is surely not the degree of enlightenment with which men pursue their activities to their own advantage; it is self-forgetfulness, it is self-sacrifice; it is the disregard of personal pleasure, personal indulgence, personal advantages—remote or present—because no other line of conduct is right. We are sometimes told that (this is but another way of expressing the same thing) when a man prefers doing what is right it is only because doing right gives him a higher satisfaction. It appears to me, on the contrary, to be a difference in the very heart and nature of things. As Froude rather aptly remarks, the martyr goes to the stake, the patriot to the scaffold, not with a view to any future reward for themselves but because it is a glory to fling away their lives for truth and freedom. And so through all phases of existence to the smallest details of common life, the beautiful character is the unselfish character. Those whom we most love and admire are those to whom the thought of “self” never seems to occur; who do simply and with no ulterior aims; with no thought of pleasure for themselves; who think of nothing but what is good and right and generous.

Is this merely selfishness more enlightened? I do not think so. The essence of true nobility is neglect of self. Let the thought of self pass in, and the beauty of a great action is gone like the bloom from a withered flower.

But can we, in justice to ourselves and our families and in anticipation of a more scientific progress, wholly adhere to the noble ideals of martyrdom? Of course not! Everything we do in life in order to achieve the goal of success we accomplish at the sacrifice of something, it is true, but we must moderate the degree. It is essential that we *equip ourselves mentally*,



*morally, physically and financially, that we may contribute the best that is in us to mankind.*

In all the varying fields of human activity each man is given the chance to form his own conception of happiness and success, and pursue them in his own way; but it is inevitable that the same tendency should make itself manifest in our educational ideals and methods.

From statistics compiled recently I find that in the United States there is a ratio of 3,000 persons to each dentist, and yet the remuneration is obviously not commensurate to the services rendered. And these conditions prevail in foreign countries, with some few exceptions. This I know from personal observations. To me it suggests a deplorable state of affairs that a country as populous as ours cannot support the dentist so that he can comfortably and consistently live up to the social requirements of the profession.

Those of you who know me will support me in the statement that money-making is not, by far, my ideal of life, or I would not have arduously and devotedly remained in a profession which is so underpaid; but you must agree with me that money is practically indispensable to a man who means to fill an important place in his profession by practicing conscientiously and delving deeply into the science in all its branches; that it must necessarily consume much time and, to use rather a commonplace expression, "Time is money."

When you look over the list of men who magnanimously have given their lives to the uplift of the profession and are gone to the Great Beyond, you must admit that much less fame has been accorded them than has been already given to Honus Wagner, Jack Johnson, or a host of other sports and athletes too numerous to mention. These men have certainly contributed much less to the cause of humanity than our past and present over-toiling dentists.

To me it appears that the dentists are placed upon the earth simply to toil for their own animal subsistence, and a meager one at that and to add to the beauty and health of a large community.

There are some who would have us believe that the man of means is to be pitied because he knows no stimulus to the least endeavor. I will admit that the poor man has the finest inheritance one can have. But why do we call it fine? Merely because it is an incentive to added energy; that he may better his conditions and provide for his old age. Assuming this to be true, how far then has the dentist gone? Do his sacrifices bring him any satisfaction? Almost every dentist practicing today has experienced great difficulties from the start; and after all has been done, what are their possessions at the present time? Do not the majority of us find it necessary to struggle for our daily bread and butter? From an economic and practical point of view can we, for the sake of those dependent upon us, be satisfied with our condition?

Comparing the industries and professions in their direct influence upon the health and general welfare of humanity, what has been our material

reward for our many years of struggle from our college days to the present time? How far have we been permitted to travel and enjoy the blessings of Nature to which I honestly believe we are entitled by virtue of the noble services we render mankind? No day is well spent in which a man has not devoted a fair share of his time to life in the open air. Mr. Lowell told us that such is essential for genuine poetry of Nature's kind—poetry without furs and feathers.

He might have gone much further to tell us that without open-air training there is no life of original strength. Need I add that man has also need of the training gained in society? And how much society and fresh air does the dentist get?

When I say that dentists are entitled to a more earnest consideration, I mean it in all sincerity. Dentistry is a special calling, a full-grown science. The dentist has relieved suffering humanity from the most excruciating pains and by preserving or restoring the organs of mastication he has imparted youthfulness to age, restored health to the dyspeptic; for ugliness he has substituted symmetry of features and has replaced distinct enunciation for the broken, inarticulate, lisping of toothless decrepitude. And furthermore, I will bear indulgently the responsibility for the statement that the arduous labors of the dental profession will bring about a consensus of scientific opinion that the various lesions of dental organs are incubators, breeding germs, the majority of which create ailments of a serious nature. Is it not perfectly natural that we become rebellious when, in the face of such achievements, we are confronted with ingratitude? Do not most of the patients presume that they are doing us a great favor when they come to us to get their teeth attended to—especially so when the bill is sent? They do not seem to realize for one moment that for a few dollars you have given them services for which you have harnessed your body, mind and soul for years, as well as the thousands of others who have contributed to your knowledge. Do you not find that on the slightest provocation patients return and you are at once the recipient of remarks equal to insults?

Consult a few dental depots in strict confidence and you will be told the number of good and conscientious men in the profession who cannot pay their bills promptly. Why tolerate such conditions? There is something radically wrong somewhere. Ask the secretary of any society or church concerning the percentage of dentists in attendance. The answers will be surprising. All for want of time. Always busy and always tired.

With such conditions existing we are not justified in considering exceptional men, who, through various circumstances, are favored by fortune. There are few Dr. Evanses who were fortunate enough to carry Empress Eugene across the frontier during the French Revolution. Besides receiving 5,000,000 francs, he became dentist to the Royalty of Europe.

The great sources of intellectual power and professional services rendered a whole community are certainly deserving of a more earnest consideration. Even a government can not, and does not, extend the bounds

of knowledge; can not make experiments in the laboratory; explore the laws of Nature or establish the principles of criticism, morals and religion. The energy which is to carry forward the intellect of a people belongs chiefly to private individuals, who devote themselves to lonely thought, who worship truth, who originate the views demanded by their age, who help—or who at least try to help—us throw off the yoke of established prejudices, who improve all modes of education or invent better. It is these great men who contribute to the growth of a nation's mind. But it too often happens that their station obstructs rather than adds to their usefulness.

No matter how the ideal of the profession may be considered by us, are we justified in compelling our families to suffer with us? May we and dare we disturb their comforts in life? No matter what the degree of intelligence of your spouse, it is only perfectly natural for her to complain at her lot in life. Is she to be blamed? She cannot be satisfied with your talking, thinking and dreaming teeth.

I feel in my heart that I can appeal to you without effort that the sacred duty we owe to our parents, our wives or children overbalances the ingratitude and meagre remuneration of which we are the recipients. As has been often said, "Charity begins at home." Can anyone truthfully say that we are not making sacrifices in that direction that overbalance **even** our achievements? Of course not! What is there in life more noble than to provide for your aged parents, your wife and your children? I need not dwell on the care-worn figure of the dentist as he makes his way homeward. His very walk and countenance are indicative of his many trials and disappointments. And he must necessarily bring gloom home to his family who are anxiously awaiting his homecoming.

There are few dentists who are not as eager for patients as is a hunter for game. And after he gets them, what? Nothing but a scarce, quickly-vanishing reward.

Here permit me to state, for fear that my views may be misconstrued, that it is not my intention, even in the smallest degree, to belittle the profession. I desire to impress upon the minds of my fellow colleagues that analyzing the nature of our useful work and the achievements attained in its development clearly shows the inadequacy of its gratitude and reward. I claim that the dentists of the past and those of the present have proven, by their indefatigable labors, the justification of their claim to be classed among the first of the sciences. In a speech recently, the Honorable Richard A. Ballinger said, "The greatest menace of our day is the lack of reverence for men in higher places."

With a most respectful attitude and in the spirit of true sincerity, having the welfare of the dental profession at heart, I humbly suggest the following which appeals to my judgment as the only means of reaching the millenium:

In the first place we must try to stimulate the impression and feeling of the public as they appear from time to time in our offices that they are



in need of our services in a greater degree than we are obliged to render that service to them.

We dare not display eagerness for a patient, for his money, or set a definite price on the various kinds of work (unless in exceptional cases). This is to convey the idea that the products of the dentist cannot be compared to commodities that have a standard market value. This recalls to my mind an answer I made to a patient some time ago. She asked me how much I charged for gold crowns and I replied that it depended on the quantity desired and whether she preferred taking them with her or having them sent.

Our services should be valued not by the amount of material or time consumed but by the volume of anxiety involved in each individual case.

Perhaps it will take years to affect a change but we should always have in mind the remark of Alexander's, when passing to Asia, he dispensed large sums of money to his officers and principal men, and being asked what he kept for himself he replied simply, "Hope."

Finally, we must cling to the loftiest ideals of our profession and bear in mind the nobility and dignity of our calling in honor of the great men who have adorned it and established the pillars of its glory. Then and only then can our society truly and consistently be called an Odontological Society.

#### DISCUSSION

DR. PAULINE HORVITZ: In the paper just read by Dr. Rosenthal he has presented a most timely subject for our consideration, offering us a great deal of food for thought. Before I enter into the discussion of his paper I want to state that the percentage of men and women that have been fortunate in securing considerable of the world's goods is exceedingly small in proportion to the number of people engaged in the struggle. On every hand there is a cry of despair, nearly everybody is being underpaid, and the dentist is no exception.

The dentist, as a member of society, while contributing his share toward its development and progress is subject to the same laws and influences as the physician, attorney, engineer and business man. But under the existing conditions each professional class will have to take up the problems that confront it and seek some effective solution. We, as dentists, must analyze the subject and find the cause why we are compelled to make so many sacrifices—physical, mental, religious, social and financial—and yet are not being properly remunerated.

William George Jordan, in his work "The Crown of Individuality," says: "There are four great hungers of life: body hunger, mind hunger, heart hunger and soul hunger. They are all real, all need recognition, all need feeding. These hungers are not a modern invention, they are as old as history and they began in the Garden of Eden. We have all these four hungers because we are human—because we are higher than the animals; they are aspirations and were meant to be satisfied. True living means realizing the real hungers of ourselves and others and seeking to satisfy them."

If you will stop to consider for a moment we, as dentists, can consider three of the above mentioned desires as entering into and affecting our welfare. I have always entertained the opinion that a great deal of crime for which so many people are being censured is due to economic conditions, and, in this connection, I want to say that 75 per cent of the crimes committed in dentistry are due to the fact that the dentist is not adequately reimbursed for the time, education, energy and money he puts into his work. I doubt very much whether there would be quite so many dentists extracting

teeth that could be saved and substituting large bridges if it were not for the fact that they know they can get higher fees for bridgework than they can for a few fillings.

Nobody can dispute the claim of a hungry body having right of way over all other needs.

Mind hunger, which has been defined as the craving for intellectual food, is a desire that the average dentist cannot always satisfy. The dental practitioner, much as he would like to partake of the pleasures afforded by the arts, such as music and literature, is not always in a position to do so. By the time he has satisfied his material wants he has very little left for the cultural pursuits. Particularly is this true if he wants to enjoy these pleasures with his family.

Heart hunger: I do not think it necessary to define this desire to this audience. For those of you who were brave enough to enter into matrimony know what an expensive institution it has become.

What can be done so that the dentist, as a member of society, can secure what he is entitled to?

As a remedy for the unfairness which we suffer in not being sufficiently reimbursed I would suggest that we, as members of a profession devoted to the highest ideals of humanity, should endeavor to inform people of all classes and professions, particularly the medical profession, what the dentist is doing for science and how important a place he fills in the life of the community.

Any intelligent man will readily admit that the care of the teeth plays an important part in the health of the individual. Therefore, the knowledge of the importance and care of the teeth should be spread broadcast so that a higher appreciation of dentistry will be felt; then, in due time, we shall receive the rewards to which we are rightly entitled.

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### The Dentist

Let others knock him, if they choose,  
But I shall evermore refuse.  
The dentist causes pain, 'tis true,  
But often he relieves it, too.  
For when I have a grumbling tooth  
That knows no tenderness, nor ruth,  
I seek the dentist's office out  
And have that toothache put to rout.

Then let us praise the dentist,  
Nor kick about his little bill;  
For were he not so great a wiz  
With bridges, crowns and things, Gee whiz!  
A lot of us who now can smile,  
Thus showing teeth of class and style,  
Would slink about ashamed instead,  
Without a tooth within our head,  
Our beauty gone beyond recoup,  
Our daily food reduced to soup!

And so, in spite of drills and such,  
Which irritate us very much,  
We ought to sing a happy song  
To boost the dentist's work along!

—Berton Braley.

## HORACE WELLS AND THE DISCOVERY OF ANESTHESIA.

By Edward C. Mills, D.D.S., Columbus, Ohio.

The accompanying photo-engraving is an autograph letter of the widow of Dr. Horace Wells, the discoverer of anesthesia. The original, now in the library of the Ohio Dental Library Association, was probably addressed to the late Samuel D. Gross, Professor of Surgery in the Jefferson Medical College, Philadelphia. The evidence that accompanied it was no doubt used by him in his work, "American Medical Biography," edited in 1861.

It is an interesting fact that Priestly, the eminent English philosopher, chemist and theologian, who discovered nitrous oxide, should be obliged in 1794, as a result of heterodox and liberal opinions expressed in his writings, to seek a tranquil life in the United States; here his gas, instead of producing conditions for the amusement of spectators, proved in the hands of Horace Wells to possess merits that were to prove the greatest blessing to mankind.

Forty years after the death of Priestly, Wells made the discovery of the anesthetic properties of the gas: two years later, in 1846, Dr. W. T. G. Morton of Boston, who had been a student of Dr. Wells, began his experiments with sulphuric ether. This produced the long anesthetization necessary in surgical operations, and Wells in the meanwhile endeavored to improve methods of administering nitrous oxide to prolong insensibility, but it was beyond his power. His great anxiety, and the experiments made with chloroform referred to in the widow's letter, unbalanced his mind and he committed suicide in New York City in 1848, in his thirty-third year.

Paul Bert, whose medallion appears on the monument to Dr. Wells in Paris, solved the problem that had baffled Wells: that of producing prolonged anesthesia with nitrous oxide. Knowing that pure nitrous oxide anesthetises but asphyxiates, and diluted it no longer asphyxiates but ceases to anesthetise, Bert compensated for the effect of dilution by administering a mixture of five volumes of the gas with one volume of oxygen—thus producing the nitrous oxide and oxygen which today is rapidly supplanting ether and chloroform in surgical operations.

Horace Wells, dentist of Hartford, has been acknowledged throughout the scientific world as the discoverer of anesthesia, and as such his fame will resound through the ages.

While the dental and medical professions may seem tardy in doing justice to his memory, the following memorials will perpetuate the fame of this great benefactor:

A life-size bronze, erected by the dentists of Connecticut and the Connecticut State Medical Society in 1874, adorns Bushnell Park in the city of Hartford. In 1894, on the fiftieth anniversary of the discovery, a memorial tablet, with appropriate inscription and medallion of Wells, was presented to the city of Hartford by the dental profession and placed on a building marking the place where the discovery was made.



Hartford April 1860.

Sir,

As the widow of Dr Horace Wells I beg leave to address you. The discovery which my husband made and which has so largely benefitted mankind has been to his family only a source of bitter misfortune. The experiments which he constantly made upon himself terminated fatally and he died in fear and despair that the fame due him would not be accorded after his death.

The only inheritance which Horace Wells has left is the reputation which he had earned as a benefactor of mankind and my highest ambition is to leave this unquestioned before the world.

Although it may now be too late to do anything but justice to my husband's memory I pray that at least this may be accomplished.

To this end let me beg you to give some attention to the evidence which will be forwarded to you. It has been prepared by the friends of a helpless woman whose duty it is to redeem the memory of a good man and rescue the credit of his discovery from the grasp of men who presuming upon his sensitive nature and afterwards upon my helpless widowhood have laid claim to a discovery which I know belongs to my husband alone

Yours respectfully  
Elizabeth Wells.

A bronze bust of Dr. Wells, presented by the dentists of America in 1899, was placed in the library of the Army and Navy Museum, Washington, D. C.

In the *Place de Etats Unis*, in Paris, France, is a bronze group of Washington and Lafayette, presented by Americans in 1895, in commemoration of the aid of France in securing the independence of the United States. What site more appropriate could have been chosen by our foreign confreres for the recent memorial to Dr. Wells? An expression of appreciation of an American dentist's contribution to the world of science—a benefactor to suffering humanity.

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### Indiana State Board of Dental Examiners

The next meeting of the Indiana State Board of Dental Examiners will be held in the State House at Indianapolis, beginning Monday, January 13th, 1913, and continuing four days. All applicants for registration in the State will be examined at this time. No other meeting will be held until June, 1913. No temporary permits are issued. For further information address the Secretary,

F. R. HENSHAW,  
508 K. of P. Bldg., Indianapolis.

# LISTERINE

Listerine is a fragrant non-toxic antiseptic composed of volatile and non-volatile constituents, agreeable to the taste, refreshing in its application and lasting in its antiseptic effect.

Listerine is of well-proven value in the antiseptic treatment of all parts of the human body—whether by spray irrigation, atomization or simple local application, and is well adapted to the requirements of general

## DENTAL PRACTICE

- To cleanse and deodorize before operating;
- To wash and purify the mouth after extracting teeth;
- To treat antiseptically, diseases of the mouth;
- To prescribe as a detergent, prophylactic mouth wash for daily use in the care and preservation of the teeth.

The prompt action of Listerine in cleansing and purifying the mucous surfaces and its cooling, refreshing effect upon the tissues is very grateful to the patient. Listerine has received the highest recognition as the best general antiseptic for a Dentist's Prescription.

*The Dentist's Patient.* A leaflet designed to convey useful information respecting the care of the teeth. Supplies of this interesting treatise on oral hygiene are furnished free of expense to dental practitioners for distribution among their patients. A specimen copy, together with an order-form, will be sent upon request.

*Be assured of genuine Listerine by purchasing an original package*

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# SOCIETY ANNOUNCEMENTS

## Minneapolis Dental Society.

### Important Notice of Change in Date.

The dates of the Minneapolis Dental Society meeting have been changed from January 24th and 25th to January 17th and 18th. This change was necessary in order to effect a more perfect co-operation with the other large meetings in the West.

For further information address O. DEFOREST DAVIS, *Sec'y.*,  
404 Donaldson Bldg.

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## North Dakota Board of Dental Examiners

The next meeting of the North Dakota Board of Dental Examiners will be held in Bismarek, North Dakota, January 14th, 1913, and continuing for four days. All applications for examination must be in the hands of the Secretary by January 4th, 1913. No other meeting will be held until July 8th, 1913. For further information apply to F. A. Bricker, Fargo, North Dakota.

Very truly yours,

F. A. BRICKER, *Secretary.*

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## Idaho State Board

The Idaho State Dental Board will meet for examination January 6, 1913, in Boise, Idaho.

ALBERT A. JESSUP, *Sec'y.*

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## Indiana State Dental Association

The fifty-fifth annual session of the Indiana State Dental Association will be held in the Claypool Hotel, Indianapolis, May 20, 21, 22, 1913.

The officers of the association recently met at Indianapolis and perfected plans for a three days' "Post Graduate Course." The very best instructors and specialists are being secured for each day.

The course will be as follows: Tuesday, "Humanitarian Dentistry"; Wednesday, "Preventive Dentistry"; Thursday A. M., "Prosthodontia"; Thursday P. M., a great table clinic. The clinic will be held in the hotel.

No tuition fee for the members of the association or visitors from outside the State who are in good standing in their State Association, but all others desiring to take this course must arrange their tuition fee with the secretary.

OTTO U. KING, *Sec'y.*

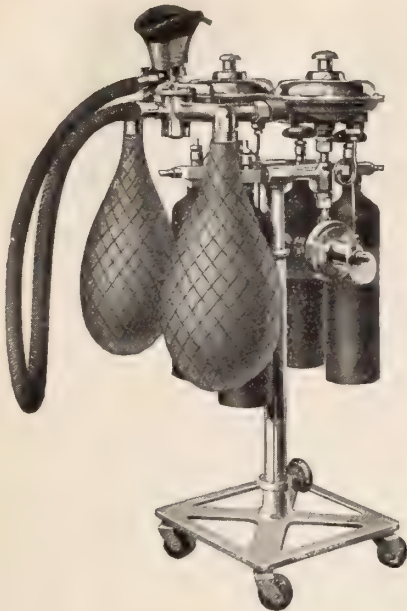
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Gives uniform results.  
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**Ohio Style F Cylinders.**

The flow of gas is then reduced  
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Latest and Best Gas-Oxygen Outfit

Even and continuous flow of gas.

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# NEW PUBLICATIONS

*A Text-Book of Dental Pathology and Therapeutics.* For Students and Practitioners. Based upon the original of the late Henry H. Burchard, M.D., D.D.S. Rewritten by Otto E. Inglis, D.D.S., Professor of Dental Pathology and Therapeutics in the Philadelphia Dental College, Philadelphia. New (4th) edition, thoroughly revised. Octavo, 768 pages, with 671 engravings and a colored plate. Cloth, \$5.00, *net*. Lea & Febiger, Philadelphia and New York, 1912.

A new edition of this work should need no introduction to the profession. Dr. Inglis has again revised the volume, bringing it well up-to-date in every department. It is a text-book of the principles and practice of dental medicine for students, and a reference work on applied special pathology and therapeutics for practitioners of dentistry. The book supplies the scientific foundation necessary to an intelligent understanding of dental medicine. It explains such general subjects as predisposition, immunity, micro-organisms and resistance, and then proceeds to the applied special pathology and therapeutics of all dental diseases. Its orderly statements and clear exposition will qualify its readers to avoid errors in diagnosis and treatment.

*A Manual of Chemistry.* A Guide to Lectures and Laboratory Work for Beginners in Chemistry. A Text-book specially adapted for Students of Medicine, Pharmacy and Dentistry. By W. Simon, Ph. D., M.D., Professor of Chemistry in the College of Physicians and Surgeons, Baltimore, and in the Baltimore College of Dental Surgery; Emeritus Professor in the Maryland College of Pharmacy; and Daniel Base, Ph. D., Professor of Chemistry in the University of Maryland. New (10th) edition, enlarged and thoroughly revised. Octavo, 774 pages, with 82 engravings and 9 colored plates, illustrating 64 of the most important chemical tests. Cloth, \$3.00, *net*. Lea & Febiger, Philadelphia and New York, 1912.

The degree of approbation accorded this work by the Medical, Dental and Pharmaceutical professions is shown by the demand which has exhausted nine previous editions, each in several large printings. This new revision makes its appearance at a most opportune season—namely when students are about to begin the academic year and when physicians, dentists, pharmacists and chemists are preparing for their winter's work. The manual still preserves the plan and characteristics which have won for it its greatest popularity. Numerous additions have been made, most of which are of fundamental importance and again bring it abreast of modern thought in chemistry. Ionic relations are discussed in practically every chapter on acids and the metals, and a number of compounds have been added to the sections on inorganic and organic chemistry. The section on physiological chemistry has been rewritten and brought in line with present-day knowledge and theories. Special care has been taken to introduce here the most modern methods for chemical examination in clinical diagnosis. The facts and data which are of direct interest to the physician, pharmacist and dentist have been placed in the foreground.

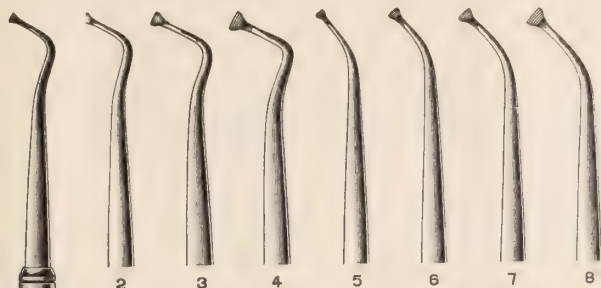
*Dental Jurisprudence: the Law Relating to Dentists and the Practice of Dentistry.* By William E. Mikell, Professor of Law in the University of Pennsylvania. 12mo, 570 pages. Cloth, \$2.75, *net*. Lea & Febiger, Philadelphia and New York, 1912.

Dentistry is now recognized both by statutory law and judicial decisions as a specialty of medicine, and the same need therefore exists among dentists as among physicians for an understanding of their legal relations. In addition, many states now require by law a knowledge of dental jurisprudence as a prerequisite to the right to

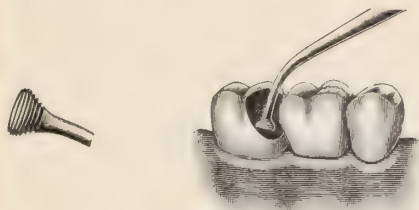


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Dr. C. F. C. Mehlig  
for the  
preparation of the  
cervical margin



Nos. 1 to 4 are intended for the lower teeth.

Nos. 5 to 8 are intended for the upper teeth.

They are especially designed for the preparation of the cervical margin, buccal and lingual walls in compound cavities of Bicuspids and Molars.

They will cut on all sides, and should be used with a right to left and left to right motion across the cervical margin until a flat and smooth seat is obtained, with edges slightly beveled, which feature is so essential for the proper preparation of cavities to prolong the life of a filling or inlay.

They are safe sided on both ends and therefore injury to the pulp and adjoining tooth is impossible.

They are made of the best of steel, tempered very hard and each blade is stoned by hand to produce a smooth and easy cut.

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practice dental medicine. Hitherto no work has been available which presented in concise form the material constituting dental jurisprudence. In this volume Professor Mikell has discussed the status of the dentist, his rights, his various relations, his liability to patients and the state, and his part as a witness and as a jurymen; and has concluded by giving a summary of the statutes regulating the practice of dentistry in the English-speaking countries of the world, so that the usefulness of this book is not limited to any one section, or to any particular country. A carefully prepared index and table of contents place any point immediately at command.

*Lectures on General Anesthetics in Dentistry, Advocating Painless Dental Operations by the Use of Nitrous Oxid, Nitrous Oxid and Oxygen, Chloroform, Ether, Ethyl Chlorid and Somnoform.* By William Harper DeFord, A.M., D.D.S., M.D., Dean and Professor of Oral Pathology and Anesthetics, Drake University College of Dentistry, etc. Second edition, with illustrations. Lee S. Smith & Son Company, Pub., Pittsburgh, Pa., 1912.

The object of this book is to give the busy dentist a working knowledge of such general anesthetics as can be used to advantage in daily practice. With this in view, the author has prepared what he has to say—the form of brief lectures. The lecture style enables the author to talk directly to the individual just as is done in the class room, and to repeat and emphasize from time to time the more important and essential things which is not permissible in a text-book. The book is a practical treatise and not a theoretical exposition. The author has devoted years to the study, investigation and teaching of anesthesia and anesthetics and the clinical application of general anesthetics, and this has fitted him thoroughly for the preparation of such a work. It is a guide that every dentist should possess, for all dentists should understand all about anesthesia and the best modes of administering anesthetics, especially nitrous oxid.

*Goepp's Dental State Board Questions and Answers.* By R. Max Goepp, M.D., Author of Medical State Board Questions and Answers. Octavo volume of 428 pages. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, \$2.75, net.

The author states that the questions used in the text are representative of the kind of questions asked by State Board Examiners in all the States of the Union. All questions found to have been asked repeatedly and by the majority of examining boards have been included and additional questions inserted to give a comprehensive summary of each subject. The text is arranged so that questions bearing on the same subject are grouped together. The author says the volume is intended primarily for those preparing themselves for examination, but can be used by students in their undergraduate work and by practitioners in general as a ready reference hand-book. To be used as a quiz to freshen the memory of facts in the various branches, the book may serve a useful purpose, but to be depended upon to furnish complete knowledge to a candidate for examination by a State Board is wrong. The man who is licensed to practice dentistry should know more than a mere smattering of the fundamentals. While the securing of a license to practice dentistry is an essential thing, there is a far greater knowledge required to thoroughly fit a dentist for successful practice, and if a man has obtained this knowledge from his studies in college, or otherwise, he should have no difficulty in proving to a Board his fitness to be licensed.

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BORN: To Dr. and Mrs. William A. Hart, Lapeer, Mich., November 12, a girl, Marjorie Higbee Hart. Father and mother doing well. We congratulate all concerned and hope the welcome of little Marjorie into the world will be a warm one.

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MARRIED: At Grand Rapids, Mich., about November 15, Dr. Horton B. Peck, of Reed City, Mich., the oldest practicing dentist in the State, having worked at the chair for over sixty-two years, was quietly married to Miss Isabel Presley, sixty-four, of Clare, Mich.





